

# MINING

## CONGRESS JOURNAL





# DESTINATION UNKNOWN . . .

For more than seventy years\* we have known where each of our drills went, how it was being used, what kind of rock it was drilling and how the customer liked it.

This knowledge has enabled us to continually improve our line of rock drills . . . men can now mine greater quantities of vital ores and build fortifications, air fields, highways, tunnels and dams more rapidly than ever before.

Now the picture is different. Many of our rock drills are going to war. Their destination is unknown. Yet, we send them out fully confident that they will do any job of rock drilling in the best possible manner. Our faith in them stems from the immense backlog of experience upon which they are built.

And when victory is won, Ingersoll-Rand rock drills will be ready to do their part in the huge reconstruction program that will bring higher standards of living to the free nations of the world.

\*Simon Ingersoll invented the first practical rock drill in 1871.



All plants of Ingersoll-Rand Company are flying the Army-Navy "E" awarded "for high achievement in the production of war materials."

5-242

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11 BROADWAY—NEW YORK, N. Y.

# MINING

CONGRESS JOURNAL

VOLUME 29, NUMBER 6

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FOR JUNE 1943

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The July issue of Mining Congress Journal will be devoted in large measure to the program papers and addresses which will be presented at the Coal Mine War Conference July 19-20 in Cincinnati. No one knows better than coal operating men and executives that the war time problems of the industry stand out in bold headlines. Therefore the July Mining Congress Journal will summarize achievements of this industry.

From the metal mining industry we will present a comprehensive article on Safety First at the world's largest copper mine.

**Front Cover—A student miner in a "Student Stop," Butte, Mont.**

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*Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress.*



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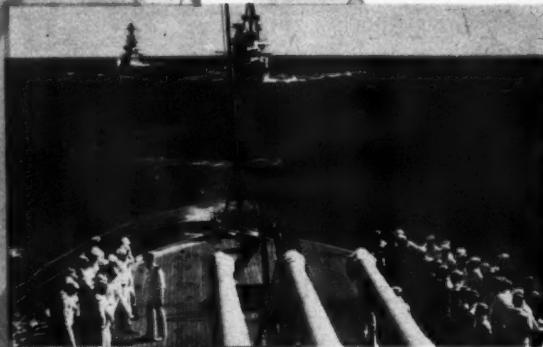


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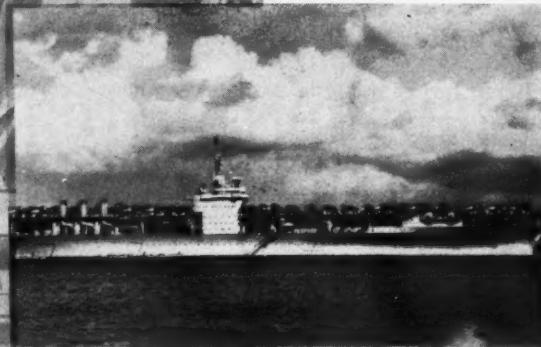
# The Battle for **FREEDOM**



U. S. NAVY OFFICIAL PHOTO THROUGH UNDERWOOD & UNDERWOOD  
The Navy on Parade is impressive.



Soldiers of Production are vital too.



U. S. NAVY OFFICIAL PHOTO THROUGH UNDERWOOD & UNDERWOOD  
Aircraft Carriers are the Navy's landing fields.



JOY Workmen are modern craftsmen—the workmanship in  
JOY Equipment is unsurpassed.



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Power to strike hard and often is essential.

**SPECIFY JOY mechanized Loaders and Shuttle Cars**

This war is not only being fought on land and sea and in the air—but a great part of America's offensive action is taking place underground, as well.

Coal is essential to our war plants—as essential as ammunition is to our guns—and JOY takes particular pride in the part JOY Loaders, JOY Shuttle Cars and Conveyors are playing in speeding up production. For today, continuous consistent output is vital.

# and The Battle for PRODUCTION



We will be glad to submit suggestions by JOY Engineers—men who know the problems of the Coal Industry as they relate to the practical use of JOY Equipment.



JOY Loaders and JOY Shuttle Cars are engineered and built to stand hard service with a minimum of maintenance.

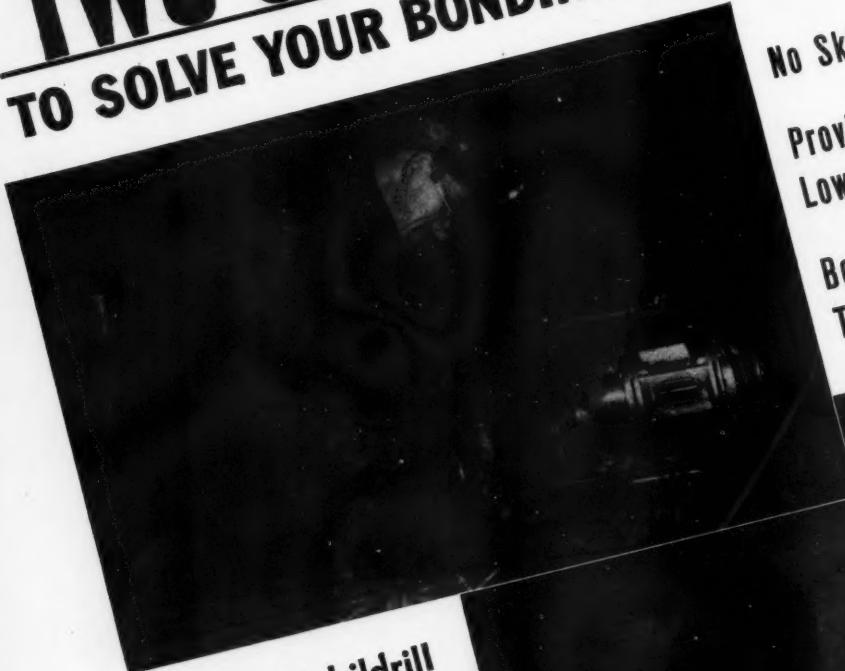
for lower cost and greater output



**JOY** MANUFACTURING CO.  
FRANKLIN, PA.

# TWO SIMPLE STEPS

## TO SOLVE YOUR BONDING MANPOWER PROBLEM



1

O-B Electric Mobildrill  
...bores proper hole  
in rail quickly and  
efficiently.

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MANSFIELD, OHIO

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KEEP BUYING WAR BONDS

No Skilled Welders Necessary  
Provides Continuous, Copper,  
Low-Resistance Path  
Bonds Applied Two to  
Three Times Faster



2

O-B Wedge Bond ... a few  
hearty hammer taps to install  
in a permanent mechanical  
and electrical joint.

2373M

ANOTHER COAL OPERATOR  
SWINGS TO TIMKEN BEARING EQUIPPED MINE CARS



Shown in the photograph are some of the 150 new modern mine cars in service at the Merrill Coal Company's mine, Henlawson, W. Va. All these cars were built by the Kanawha Manufacturing Company, Charleston, W. Va. They are the first Timken Bearing Equipped cars purchased by this operator; 50 more Kanawha cars of the same type are on order. Each car can carry from 5 to 6 tons of coal.

Coal delivered to the tipple is the only coal that counts; Timken Bearing Equipped mine cars get it there promptly—and keep getting it there. Longer trips can be hauled with existing motive power and empties returned faster. Cars can stay on the job longer because Timken Bearings maintain wheel gauge indefinitely, reduce wheel breakage and protect all running parts against radial, thrust and combined loads. Lubricating intervals are greatly extended.

Mine operators using Timken Bearing Equipped cars—and there are more than a thousand—know that these cars are essential to efficient, dependable and economical mine transportation. The Timken Roller Bearing Company, Canton, Ohio.

Will the  
mining equipment you  
manufacture be able to hold  
its own in post-war competi-  
tion? Now is the time to make  
sure; redesign and use  
Timken Bearings at every  
possible point.

**TIMKEN**  
TRADE-MARK REG. U. S. PAT. OFF.  
**TAPERED ROLLER BEARINGS**



## **Would you turn your back on a wounded Soldier ?**

*You think you wouldn't...you don't mean to...*

But unless you are giving every precious minute of your time...every ounce of strength that you can spare...towards helping win this war as a civilian, you are letting down those soldiers who are sacrificing lives to win it for you.

What you are asked to give up isn't much compared with what they're giving up. The extra work you undertake is small compared with the gigantic effort they are making. But to a wounded soldier, what you do can mean the difference between life and death.

*You make the choice.*

**LOOK AROUND YOU!** Pick your war activity—and get into it! In your local Citizens Service Corps or Defense Council there is something for every man, woman and child to do. If no such groups exist in your community, help to organize them. Write to this magazine for free booklet, "You and the War," telling what you can do to help defeat the Axis. Find your job—and give it all you've got!

# NEW Safer...More Convenient Packing for DU PONT BLASTING CAPS



Du Pont Blasting Caps are now packed in multiple, horizontal rows—instead of vertically. The result is a package that's safer, easier, and quicker to use.

#### PROTECTS OPEN CAP ENDS

Opening this new box does not expose the mouths of the caps because they rest against a permanent side of the box at all times. Thus, drops of water, sparks, grit, and other foreign matter can't get into the open cap ends. This reduces the possibility of misfires due to wet caps—and lessens the chance of accidental detonation when caps are being fused.

#### MAKES CAPS EASIER TO REMOVE

With the new horizontal packing it's easy to grasp and remove the first cap and all subsequent caps. There's no need to tip the box and the caps left in the container remain in orderly horizontal rows.

Dependability and safety are the two factors you want most in a detonator—and you get them both when you use Du Pont Blasting Caps. These caps are so reliable that users have purchased over 3½ billion since we began to manufacture them in 1897. This new horizontally-packed cap box is still another guarantee of their safe, dependable performance. E. I. du

Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington, Del.

★ ★ ★

#### SAVE FATS FOR EXPLOSIVES:

Fats are urgently needed for making glycerin—essential for the production of high explosives. Urge housewives to aid the war effort by taking waste fats to their butcher.



# Simple,

## SYSTEMATIC DRIFTER LUBRICATION CUTS REPAIRS, BOOSTS FOOTAGE



Regular lubrication is a vital factor in the performance and service given by any drifter drill. It is particularly important today when the war effort and the scarcity of strategic materials demand the conservation of every piece of drilling equipment.

Here are four simple lubrication suggestions which will help you get the most out of your CP Drifters. While these suggestions apply particularly to CP MOTORdrifters they are applicable generally to other models. Detailed recommendations on hand-cranked CP Drifters will appear in future advertisements.



Service each shift. Fill the drifters with a good grade of rock



Check the feed screw frequently. Take an oil can handy, oil feeders now occasionally.



Operating drifters turn outside and through holes to clean them through.

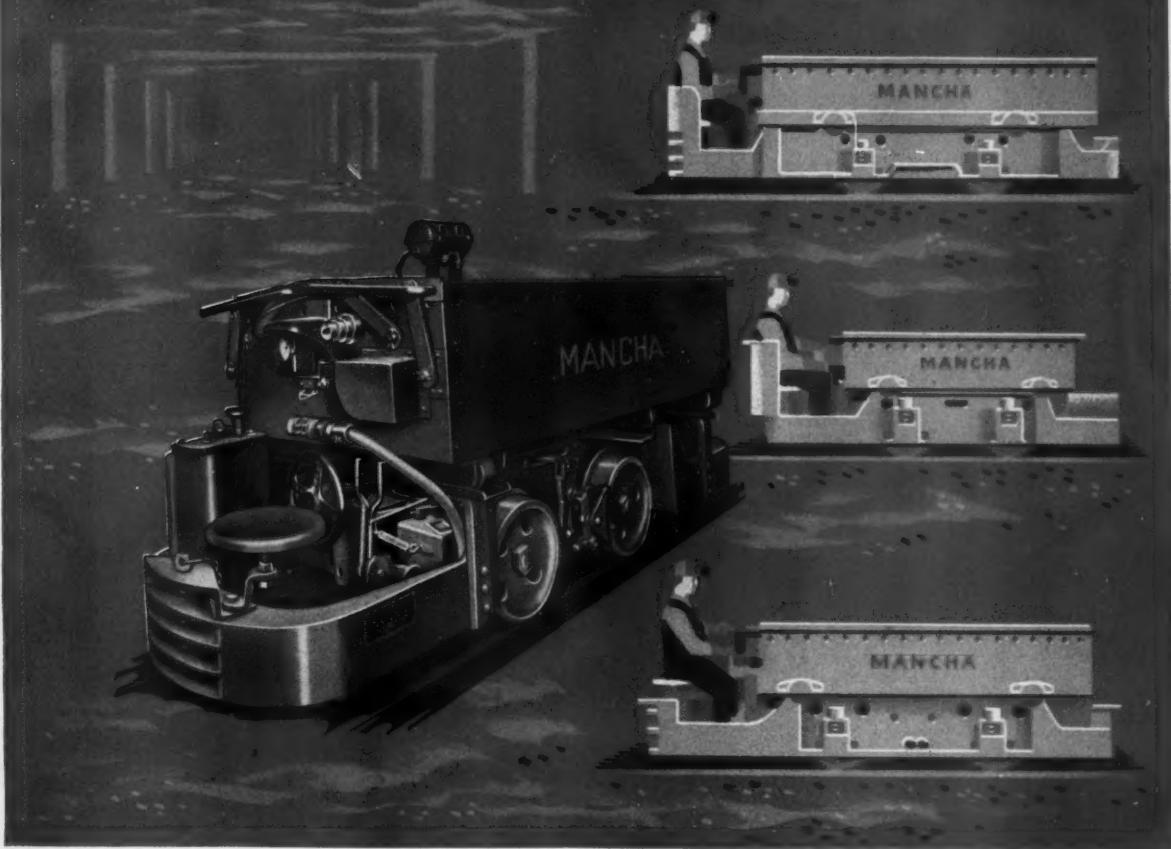
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ELECTRIC TOOLS  
(Hickey...Universal)  
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TOOL COMPANY

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VACUUM PUMPS  
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## PHILCO BATTERIES GIVE YOU GREATER CAPACITY... LONGER LIFE!

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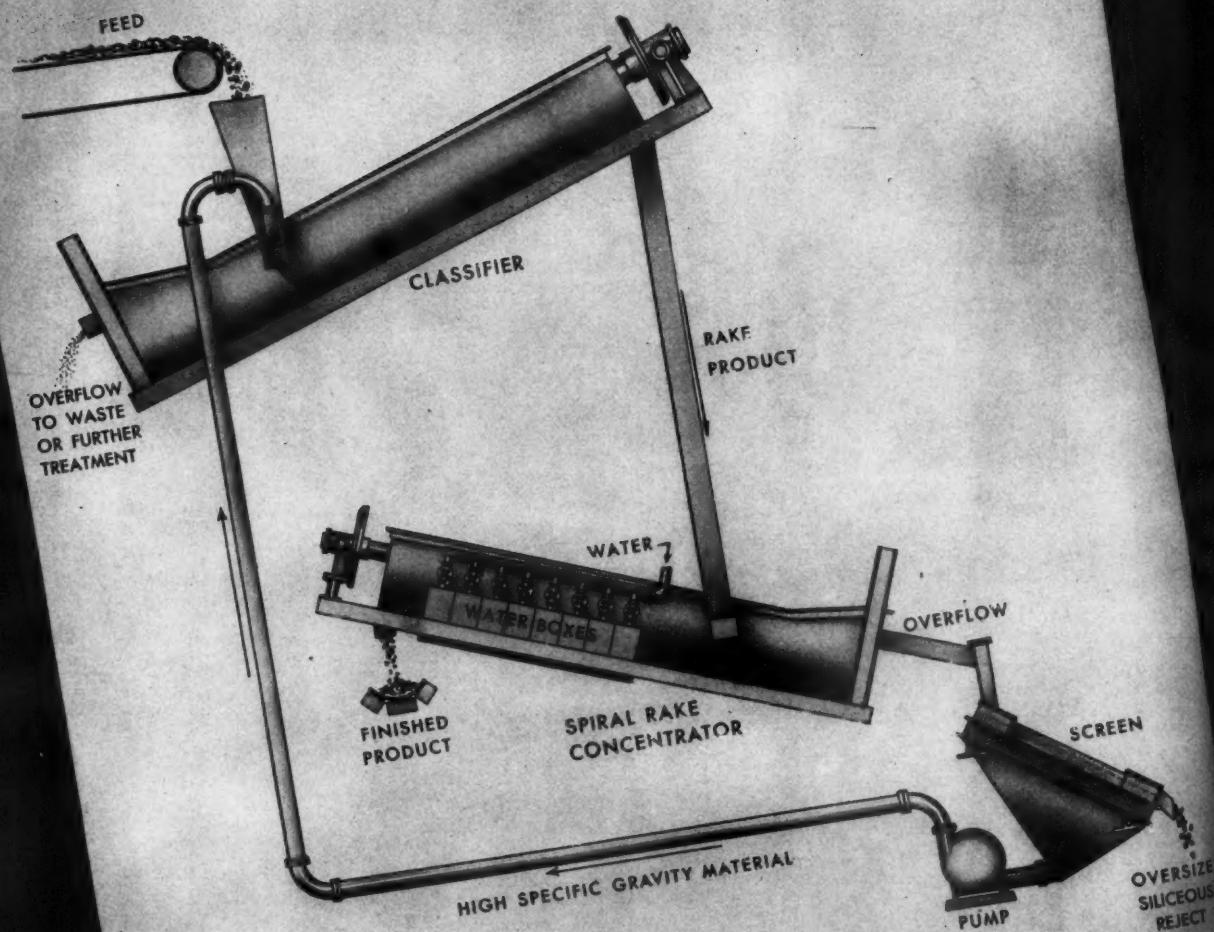
Philco Battery for Mine Locomotives  
40 Cells of Philco Type 19XVL



Replace with **PHILCO** Mine Batteries

# New Development in Fine-Ore Treatment

SCHEMATIC FLOW SHEET  
OF FINE ORE TREATMENT  
BY HEAVY-MEDIA SEPARATION



AMERICAN CYANAMID COMPANY

# by a Heavy-Media Separation Process

Using the fine heavy constituent of the ore as a separating medium, this new development in fine-ore treatment expands the field of Heavy-Media Separation to that part of the feed that is too fine for Heavy-Media Cone Plants but too coarse without regrinding for froth flotation. The process is also directly applicable for pre-concentrating or making a finished concentrate on ores requiring crushing to  $\frac{1}{4}$ " to liberate values.

Thoroughly proved by commercial use in two plants on Mesabi Iron Ore (a third is under construction and a fourth is planned for the East), pilot plant test results in the Cyanamid Ore Dressing Laboratory indicate its applicability to fluorspar, manganese, chromium and other free-milling ores. Because the fine heavy constituent of the ore forms the separating medium, it is a low-cost process requiring minimum power, labor, maintenance and plant investment.

This new development in fine-ore treatment expands still further the scope and flexibility of application of the beneficiation processes offered by Cyanamid. Whether your ore can best be treated by a Heavy-Media Separation process alone, or by a combination of Heavy-Media Separation with chemical beneficiation by froth flotation, Cyanamid can unprejudicedly recommend the flow scheme to give highest yield at lowest cost.

Cyanamid Field Engineers are available to work with you in your mill on the development of the most efficient flow scheme for your ore. The unexcelled facilities of the Cyanamid Ore Dressing Laboratory for Chemical, Physical and Microscopical research and testing, as well as batch and continuous-unit testing of metallics or non-metallics by mechanical or by chemical beneficiation processes are at the service of the entire mining industry.

*Ore Dressing Notes #12 now in preparation will describe fine-ore treatment by Heavy-Media Separation and will also contain a description of the Heavy-Media Separation Pilot Plant recently installed at the Cyanamid Ore Dressing Laboratory. A copy will be sent on request. If you have not already received Ore Dressing Notes #11 "Heavy-Media Separation Processes" for treating coarse ore, we will be glad to send a copy.*

30 Rockefeller Plaza, New York, N. Y.



**"YOU JUST OUGHT  
TO SEE THE THING,  
MARY!"**

"I'm not half as tired at the end of the shift as I used to be—no back and muscle strains. Since we did away with the old-fashioned columns and put in that Cleveland Jumbo, my work is a lot easier. Don't have to lug the column, the drifter, stulls, sprags, and all that stuff to the face. Don't have to set up the column, and then lift the drifter onto the arm. Don't have any trouble like I used to, with the set-up shaking loose—

maybe a sprag or block falling on my head. And I get my round in quicker too. You see, Mary, all the equipment goes in to the face on a car. It's easy to set up, easy to put the holes just where you want 'em. And they shoot better, too—I get more rock breakage in my round. Is the shift-boss tickled! Another thing—I don't break the steels I used to, and that means something these days, 'cause steel is hard to get. I wish you could see the thing, Mary. It really is *SOMETHING!*"

**You, too, ought to see the Cleveland MDR Jumbo. Mike is right—it really IS SOMETHING! We tell you about it in Bulletin 131A, sent for the asking.**

*The* **CLEVELAND ROCK DRILL CO.**

Branch Offices in All Principal Cities & Mining Centers • CLEVELAND, OHIO

# GOOD NEWS, J.B.!

"About that motor in the 15-ton locomotive that failed on the last shift—well, we installed a new armature and put it back in service within three hours. Fortunately, the coils and insulation we need to rewind the armature are in our store-room, thanks to Westinghouse. They made us a recommendation of a spare parts stock list for our equipment—this will enable us to have the armature rewound and available for use as a spare in a couple of days."



## Stop costly failures

by reviewing your renewal parts stocks.

The effectiveness of any maintenance program is measured by its ability to keep equipment continuously available for uninterrupted tonnage. Your maintenance organization can function effectively, only if it has the necessary materials with which to work.

With the present-day emphasis on production, an adequate stock of "Genuine" replacement parts becomes your best assurance of continuity of operation for your vital equipment. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. J-15078

J-15078

The above recommended minimum stock list is typical of thousands we have prepared for our customers. This extra "no-charge" engineering service may save you valuable hours—even days—of operating time that otherwise might be lost.

Competent and experienced Westinghouse engineers will gladly make a survey of your equipment and furnish you with a list exactly suited to your operating requirements. Call your nearest Westinghouse office today.

# Westinghouse

PLANTS IN 25 CITIES... OFFICES EVERYWHERE



## MINE LOCOMOTIVE RENEWAL PARTS

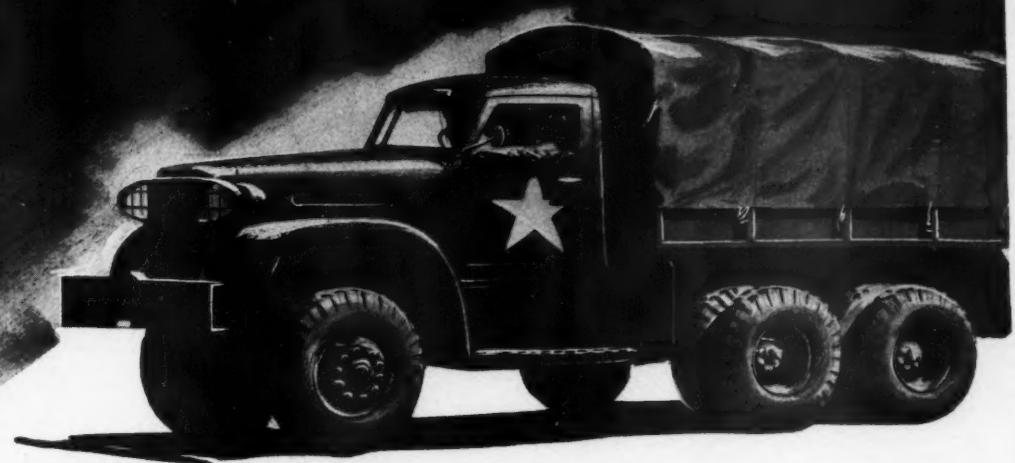
5 TRUCKS FOR C



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UNITED STATES

FOR ORDINARY WIRE



## 1 TRUCK FOR U.S. *Laytex* ASSAULT WIRE

### 4 TRUCKS RELEASED FOR OTHER MATERIEL TRANSPORT

Every day our Armed Forces are in the field, distances from base to front lengthen... problems of transportation increase... every cubic foot of space that can be saved for the S.O.S. is vital.

*U. S. Laytex Assault Wire requires only 1/5 the space in transport of ordinary communications wire.*

In the unique Laytex Process, the compounded, purified latex is applied to the electrical conductor by dipping. Conductors are perfectly centered and the weight of the insulation and the diameter of the insulated conductor are kept at the minimum.

Lightweight and small bulk are only two advantages of U. S. Laytex Assault Wire. It resists concussion and a wide range of temperature changes. Laytex is waterproof and extremely flexible.

Laytex Assault Wire weighs less than 30 lbs. per mile... a mighty important feature when men are marching with full equipment. It has a talking distance of five miles and a breaking strength of 50 lbs. per conductor.



# UNITED STATES RUBBER COMPANY

**MARION'S FIRST INTEREST IS TO WIN THIS WAR...**



What the Bill of Rights means to our fighting men is summed up in recent victories in every theatre of war. What it means to Marion is reflected in the continuous stream of Marion machines rolling off the assembly lines . . . the ever-increasing production schedules . . . the extra speed, stamina and dependability Marion engineers are building into these machines . . . the remarkable records of performance wherever they are employed. This is Marion's answer to

those who would destroy our Bill of Rights . . . Marion's

way of helping to win the war as quickly as possible.

THE MARION STEAM SHOVEL CO., Marion, Ohio.



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SHOVELS • DREDGES • CLAMMERS  
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*Somewhere south of the equator a sturdy 1-ton Mack does ground duty for one of Pan American Airways' famous flying clippers . . . Sketched by Peter Helck.*

**LITTLE CHIP OFF A RUGGED OLD BLOCK . . .**

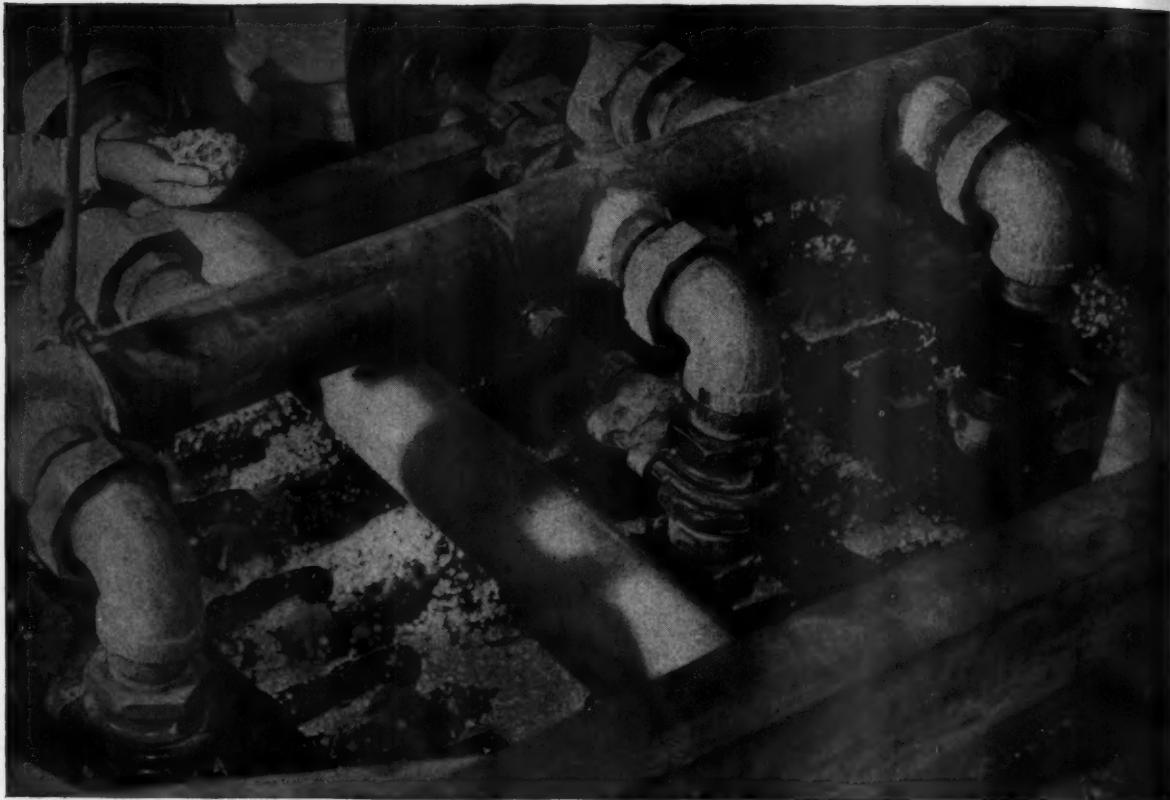
You don't have to work long with trucks—either as owner or driver—to see why the admiring phrase, "Built like a Mack truck" has established itself in America's language. On the heavy punishing jobs it has been known for years that a Mack's your *best* truck in the end because it's *more* truck to begin with. The performance of little Mack pick-up and delivery trucks in wartime transportation is proving that every Mack, no matter what size, is truly a chip off the old block.

*Mack Trucks, Inc., Long Island City, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J. Factory branches and dealers in all principal cities for service and parts.*



**IF YOU'VE GOT A MACK, YOU'RE LUCKY . . . IF YOU PLAN TO GET ONE, YOU'RE WISE!**

**Mack**  
TRUCKS  
**FOR EVERY PURPOSE**  
ONE TON TO FORTY-FIVE TONS  
BUY U. S. WAR BONDS



## OUT OF THESE FLOCS MAY COME THE FUTURE OF THE WORLD

These white crumbs or "flocs" look very unimportant in themselves . . . but on them may depend the future of the world. They are one of the first stages in the production of synthetic rubber, the most vital material being produced in America today.

Naturally, you are interested in synthetic rubber. But synthetic rubber is only incidental. What is really important is what happens to synthetic rubber after it is actually produced. It is chemistry that makes rubber fit to use, suits it to the task at hand.

United States Rubber Company is the largest manufacturer of rubber chemicals in the world. We have worked with rubber, improved it and broadened its uses for 100 years. Today, all this tremendous fund of knowledge of the chemistry of rubber is being drawn upon to improve synthetic rubber, perfect it for the jobs it must do for the Armed Forces and war industry.

The chemistry of rubber is what determines the final compounding and processing of the flocs of synthetic rubber you see here. They may eventually go into bullet-sealing hose, air ducts, or any one of a score of other parts used

in the plane that will blast the last Nip carrier off the sea. They may be made into a tire that will rumble down bomb-battered Unter den Linden. They may go into some essential equipment like a conveyor belt that will keep America's war production line moving at top speed. They might very easily determine the entire course of the war, and thereby the future of the world.

Synthetic rubber, its production, compounding and application to war and industrial uses, is too big a story to present adequately here. There are five basic commercial types of synthetic rubber. Each of them has distinct properties and characteristics. Not a single one is ideal for all purposes.

Deciding which synthetic rubber to select and use for a particular task is an equally big story, a decision that requires expert knowledge and broad range experience.

We have told the story of the five basic commercial types of synthetic rubber, our more than twenty years of experience in working with them, and our twelve years of using synthetic rubber commercially in an interesting, informative booklet for business executives. Please ask for your copy on your regular business letterhead.



# UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE, ROCKEFELLER CENTER, NEW YORK

In Canada: Dominion Rubber Co., Ltd.

# MINING

CONGRESS JOURNAL

Published for the Entire Mining Industry  
by The American Mining Congress

H. C. CHELLSON, Editor

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Number 6

## Training Metal Miners

**M**ANPOWER demand for mining is approaching its all-time high in the history of the industry, at a time when the nation looks forward to bold ventures by our armed forces schooled in the science of military strategy.

The labor shortage is serious in the west and mine operators look to the War Manpower Commission for relief through a release of more soldier-miners or other effective measures. Meanwhile, operators are bending every effort and cooperating with the WMC to make good miners from green and inexperienced material wherever available.

One of the most interesting recent developments in the metal mining industry is the training course for copper miners at Butte, Montana, undertaken by the Anaconda Copper Mining Company. Last fall when plans were under way for this project many were doubtful as to the practicability of establishing a "school for miners," because the old idea seemed to persist that the best way to train a metal miner was to put him underground and learn by beginning at the business end of a "muck stick."

The first article in this issue, describing this school, is an abstract of a report about the elementary training of metal miners at Butte. It not only tells what is being done for the war program, but describes the benefits gained by these student miners themselves. At the completion of their courses these men know their tools for mechanized production. They appreciate and understand the value of mine safety, ventilation, and the importance of geology, and also learn about human relations. From these ranks will develop the manpower seasoned through practical experience to become shift bosses, foremen and eventually operating men in responsible positions.

Today the general public knows virtually nothing about the advancement in metal mining. This industry is no longer in the era of the single jack, hand steel and candle, and the crude hit-and-miss method of mining. It has modern tools, new techniques and the increased trend toward mechanized equipment is demanding more specialized workmen.

Mine safety, for instance, has been steadfastly taught and impressed upon every miner over a period of years with gratifying results. Progress is still being made in all branches of mining but perhaps the pressure of war has quickened the pace and crystallized the vision of far-seeing and realistic

metal mine operators. They view the future of the industry as one requiring better trained men with initiative, who shall receive high wages and merit the opportunity of advancing themselves and the industry to higher levels of perfection. Such a class of workers, understanding the fundamental economic problems of mine production, operation and management can contribute much toward the ideal American mining community and fortify it with strength to meet the inevitable post-war problems.

## Yes, We Have No Meat

**A**FTER many weeks waiting for Washington authorities to come to a decision about additional meat for hard-working miners, the new meat and fat "quotas" for these men in isolated areas is 1.8 points per day or 12.6 points per week. Nationwide experience so far has indicated that an average of 17.4 meat points are used per person per week. Thus the total for miners in the isolated communities could average 30 points, or approximately 4.75 lbs. per week based on over-all meat purchasing experience. This is 3 pounds more than the average civilian now obtains.

Early in May an estimate of meat allowance per man in the Army was announced by the Office of War Information as 5.6 lbs. per week. The soldiers' "quota" therefore, is roughly about a pound more than that of the miner. Reflection by miners on this slight difference certainly is no point of issue because every miner will gladly give the fighting man everything he needs in the way of materials and supplies, as well as food.

To ease the situation for miners not in isolated communities, and to give them the same allowance as in the isolated mining camps, the Nutrition and Industry Division, War Food Administration, recommends that mining companies or possibly labor-management committees should serve as "institutional users" to provide the additional food. They point out this can be achieved by establishing canteens near the mine shafts or portals. Meat sandwiches and some processed foods could be furnished at cost. This would be in addition to the miner's regular rationing allowance as he would require no points for the supplementary ration. This practice is already under way at a large number of mines in England and this could be done here also, *providing* sufficient meat were available in the mining districts.

The inability of the OPA to fix adequate price ceilings under the zone differentials for the small district meat packers has virtually robbed many mining communities of meat shipments. The seriousness of this situation is having its repercussions in many of the western mining camps. Men are leaving their jobs and giving as their excuse, "I'm not getting enough meat." Many of these men are seeking work on the farms and in the large industrial areas where meat distribution is on a much more profitable basis for the meat packer. The Nutrition in Industry Division has announced what the meat allowances for miners shall be, and the responsibility now rests upon OPA to correct a serious handicap to the industry and bring order out of the chaos which they have created.



Drifter drills, drill steel and detachable bits and proper lubrication of rock drills are thoroughly explained

## Training Miners For Greater Copper Production

*A critical labor shortage in the Rocky Mountain region forced mine operators and public officials to give special consideration to the problem of training hard-rock miners. The training plan summarized here is the result of careful study and months of experimentation by Anaconda Copper Mining Company at Butte, Mont.*

Prepared for the Bureau of Training, War Manpower Commission

IT IS GENERALLY conceded that the hard-rock mining regions of western United States have had no satisfactory training program for beginning miners for the last several years. The days of the all-around Cousin Jack miner trained by his father to do every task in a mine in a highly satisfactory manner are gone. As a natural result of the physical and economic conditions of deep-level mining, he has slowly and more or less successfully been supplanted by a group of highly specialized drift, stope, raise and shaft miners. The change has been gradual but pronounced. As in most highly specialized fields, the breaking in of green men with the regular miner disrupts the even flow of the work, slows down the job,

By OSCAR A. DINGMAN

Professor of Mining Engineering  
Montana School of Mines and  
Consultant to War Manpower Commission,  
Bureau of Training

exasperates the other men and in places on contract actually causes a money loss to all concerned. This has resulted in greatly reducing the number of men being "brought along" or "broken in" as miners. I say brought along because there never has been a recognized system of apprenticeship for miners comparable to those of the other so-called trades. Although not so apparent in ordinary times, in periods of expansion or when sudden demands have been made on the mining industry there has been an ap-

palling lack of thoroughly experienced miners.

The present great emergency has again focused attention on this situation. This paper attempts to analyze the problem and to offer or suggest a program of training for beginning miners that would apply in many mines in ordinary times and yet be capable of the rapid expansion necessary to fit unusual or even emergency conditions.

### Selection of Program

The usual approach in considering a problem of this sort would be to study the training systems or plans followed by similar organizations in the same field. This has been done, and the following outline is submit-

ted as one that might prove useful as a reference or guide on which other interested parties might base such a selection. It represents a program that is the result of much study and investigation; of much trial and error by one large mining concern, the Anaconda Copper Mining Company at Butte, in the organization, introduction and operation of such a training effort.

No program, however carefully selected, will prove entirely satisfactory to every situation and any plan finally chosen will have to be a compromise and probably altered in many places before proving entirely satisfactory.

In considering the problem of training for beginning miners the subject falls naturally into four distinct divisions, namely: Pre-production Training, On-the-Job Training, Supplemental or Related Training and Follow-up. The first three divisions constitute the actual training instruction. The fourth or follow-up division supplies the recorded information regarding the subject matter taught and the progress made by each individual student miner or group of miners: It is the record on which each individual's supplemental training, additional training, or diversified training is almost wholly based.

#### Pre-Production Training

A well-recognized maxim in mining states that timber framing, machine repairing and all precise work of a similar nature should be done on surface where facilities and conditions for such work are generally far superior to those existing underground. Applied to the training program, however, there seems to be little doubt that, because of the impossibility of correctly simulating underground conditions and surroundings on the surface, the reverse is true. In other words, the place to train miners is in the mine itself, where the beginning miner is confronted with actual mining conditions.

It is recognized, of course, that certain preliminary instruction, as slightly differentiated from training, will be of considerable value to the green hand in his first few shifts underground. With this in view a suitable Safety and Mining Exhibit has been established in which most of the usual equipment ordinarily encountered underground is not only shown, explained, and demonstrated to the new man but is open to and arranged for his closer inspection should he so desire. The basic idea and the entire effort in this whole exhibit is not only to show both the new man and the green man something of the things they will encounter underground and the many safe practices that have been instituted for their protection but to make them feel more at home

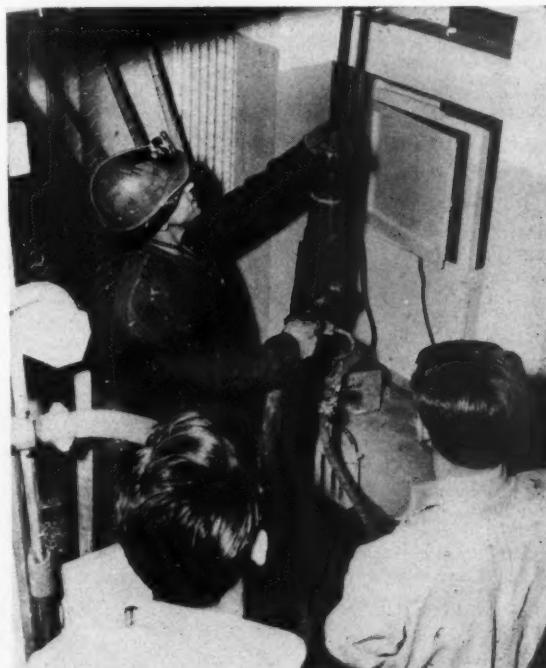
and less green, thereby attracting less attention to themselves on their first trip down.

The exhibit is compactly housed in a well-lighted, high-roofed building with concrete floor and standard-gage mine track. All equipment is full-sized; that is, standard in every respect. In truth, most of it has been removed from the mine to the exhibit in order to impress the observer with the fact that this is exactly the equipment he will be using. The building is furnished with both air and water under regular pressures for drilling, wetting down and other purposes; large blocks of native granite for machine drilling; suitable piles of muck for slusher and power-shovel loading demonstration; motor, fan and fan bag installation with regular push-button control; storage-battery haulage locomotive with operating charging panel; large mine model with operating cage, skip, skip dump and hoist; operating mine shaft signal system with station tender's bell cord and audible buzzer connections; chicken-wire-powder-stick, models for illustrating actual-size drift and stope rounds; and many other things such as tools, pinchbars and wrenches of all sorts, tool bags and boxes, powder bags, track gages and grade levels, detachable bits and carriers, blasting fuse and automatic sprayers. Needless to say the individual exhibits are well-protected with substantial guardrails and suitable heating is supplied the building. On the walls and supports, at strategic places, are hung

enlarged photographs of appropriate mine scenes and practices. Display boards and step-by-step charts of certain operations such as fuse cutting, loading, tamping, and blasting attract attention. Large samples of typical ores are displayed with the larger groups and every effort has been made to present as attractive, interesting, instructive, highly practicable and animated exhibition as possible.

On the outside of the building and in the side of a closely adjacent slope is a standard track, cars, tunnel, and the three bottom sets of a regularly-timbered raise with manway and chute mouth. On a nearby track are standard air-lock doors for trip passage and also timber trucks loaded with the usual standard timber such as posts, caps, girts, lagging and wedges. It is thought that this furnishes the transition from the surface to the underground for the whole exhibition and thus ties them closely together or bridges the gap, so to speak, for the completely green hand.

The demonstrator should be an ordinary but thoroughly experienced and highly capable miner who has been selected for the job because of his knowledge of mining, sympathetic attitude toward strangers and ability to express himself clearly and loudly. He must also have been thoroughly schooled in Job Instructor Training. Preferably, he should have the capacity to introduce a little droll wit and humor in his descriptions and demonstrations of the subject in hand. Dressed in the miner's garb from hat



A demonstration in the operation of a stoper



Learning the rudiments of "drilling the round" and the importance of safety first in handling blasting accessories

and light to hard-toed shoes and with a genial smile—the group will soon sense that he is one of them, give him marked attention and feel they have gotten something worth while.

Specifically, this whole set-up operates as follows: The man who desires work presents himself at the Labor Bureau and asks for work. He is given a signed slip, carefully directed to the Safety and Mining Exhibit and told of the time of the next scheduled lecture. Here he presents the slip to the demonstrator in charge who records the name and makes him feel at home with the rest of the group for a few moments until the demonstration starts.

At the appointed time the group is welcomed, made to feel at home and the purpose of the exhibit is explained. They are then taken to the Safety and Bulletin Board just outside of the building (usual mine location) where the importance and desirability of following the daily changes on this board is brought to their attention. It is pointed out that all safety announcements, competition records, timely topics, human interest items, union notices, display cards, contract information and all other matters of interest and importance to themselves and the mine are officially posted on this board.

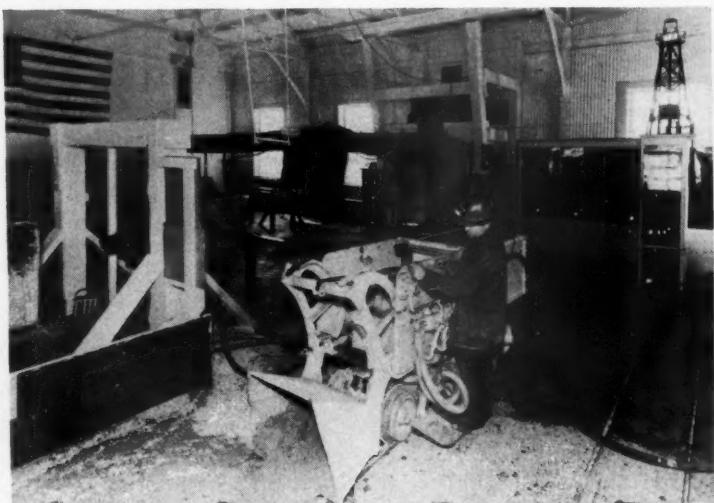
Again inside the building, the instructor begins his lecture on the individual miner's personal dress and clothing.

From here the group is shifted to the mine model where the general set-up of a mine in action is tersely but carefully explained along with two or three of the most usual systems of mining in this camp. By easy stages and without interruption or confusion the listeners are carried along through the entire exhibition. Everything is animated, everything is action and everything is modestly dramatized. The result is that the at-

tention and interest of the whole group is closely held throughout the entire period; and it is felt that much good is accomplished toward dispelling strangeness, anxiety or fear of the new man for his prospective job.

The average time of each lecture is one and one-half hours after which a question and answer period generally consumes from 10 to 15 minutes more. It has been found that periods of two or more hours detract rather than add to the effectiveness of the program. Safety is stressed throughout the entire lecture and each listener is presented with a Safety Rule book. The slips, signed by the demonstrator, are returned to each individual who presents them to the Labor Bureau where he makes formal application for a rustling card. The new but experienced miners are given cards and advised of the operating mines needing men and here they are subsequently hired. The green men are given cards and advised of mines in which student stopes are in operation. Here they later secure employment and the actual on-the-job training of the student miner begins.

It is fully realized that there is considerable divergence of opinion among persons interested in the training programs for beginners in any industry. Each industry claims special problems and desires special attention, but to one familiar with industrial training programs in general this ordinarily means only a slight alteration in the application of his perfectly general or blanket program. In this general program a considerable length of time is almost always spent in pre-production training. Plant facilities are readily available and easily alterable to fit the program. This is not true in mining. Because of inability to duplicate underground conditions above ground; the scattered or iso-



Modern metal mining requires the skill to operate mechanical loading machines

lated location of the many working places each of which presents its own special problems; the unavoidable hazardous nature of the work; the almost total dependence of one miner upon the other for his personal safety; and because of the disadvantages of cramped positions, temperature and sometimes water, it is almost universally felt among mining men, from miner to management, that the usual training programs do not apply to mining. It is our opinion, therefore, that the instruction given in this Mining and Safety Exhibit represents about the proper proportion of time that can be profitably spent in pre-production training above ground.

It should be noted that the time spent in the Safety and Mining Exhibit precedes actual hiring or employment. Should the new man, after observing the demonstration, decide mining has no appeal to him and he does not care to proceed further with it, he may withdraw. This, of course, saves both himself and the company much time and inconvenience.

#### On-the-Job Training

At this point it is assumed that the green man has attended the preliminary safety and mining demonstration, definitely decided to become a miner, has been directed to a mine having student stopes and desiring student miners and has there been hired by the hiring foreman. The need for these trainees has been discussed previously between the student training shift boss and the hiring foreman of that particular mine who has, in turn, notified the Labor Bureau. The hiring foreman closely interviews the prospective student and assigns him to that place in the mine for which the student has the keenest desire and for which he seems to be best fitted. All of this information is noted on the student's personal record sheet which has just now been started and is scrupulously kept from this point on throughout his entire training period.

It must now be clear to the reader that the above-ground pre-production training period of the student miner is over, that the fourth or follow-up division, which is his personal accomplishment record, has been started and that he is now about to enter the second or on-the-job training division. Obviously, this on-the-job training is the heart of the entire program and of the utmost importance to both the student and the company. The man has decided to enter a field entirely new to him and one that will definitely affect his entire future and the company has assumed all of the usual safety and other obligations extended to the fully experienced miner. The student is now on the company pay roll at standard miner's day's pay and the company is very definitely

and vitally interested in his personal progress and record of proficiency and attainments.

In general, there seem to be two major or basic divisions of mining operations in an underground mine, that is, crosscutting and drifting, and stoping or mining. Usually, sinking and raising are recognized as important specialities, the personnel of which is recruited from the two basic groups. It is around these two large basic groups or divisions, therefore, that the student training program is built.

In considering a training program for small groups in isolated working places that are not easily reached, which is the case in almost any large underground mine, it is apparent that great dependence must be placed in the instructor. He must be sympathetic to the program, highly capable as a miner, have a capacity to teach others and be physically able to do any of the work found necessary. The number of working places under his direction should be limited to not over two or three so that he may spend a continuous period of two or three hours with each group every day. It is the instructor's job not only to tell the student how but show him how by actually doing the job or assisting in its being done. A special student training shift boss supervises a group of three or four instructors and their respective working places. One student training foreman is in charge of all of the student training personnel for all of the mines of the company.

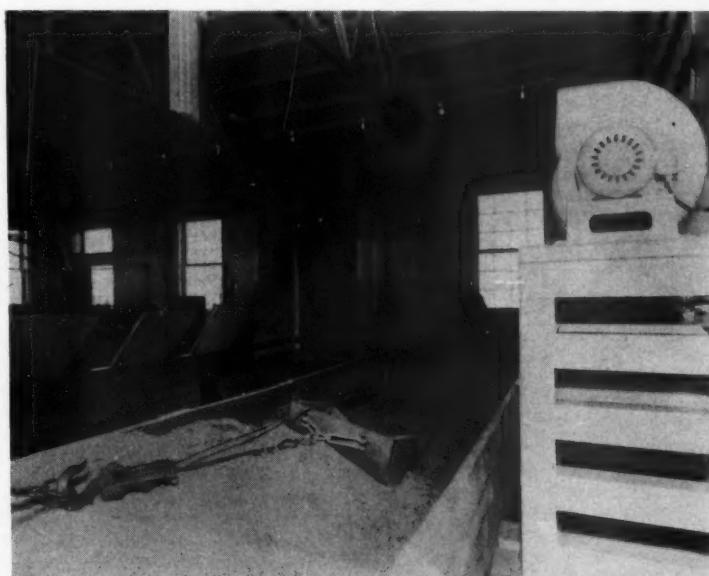
After the newness and strangeness of the initial phases of the work have

worn off and some of the rudiments of the craft are mastered, the trainee begins to feel more at home and acquires more and more confidence in himself. He generally becomes more eager to learn and the ever-watchful instructor takes advantage of this to give much additional individual instruction to the aggressive members of his various groups. This does not mean that the group explanations are lessened or that less personal attention is paid to the slow members of the crew.

As the day-by-day work in the drift, crosscut or stope progresses and the simpler, ordinary and oft-repeated tasks are accomplished without hesitation, it becomes apparent to the student miner that almost everything done in mining follows a certain cycle.

Where formerly all of the crew participated in doing a certain thing, now the group has been broken down and each man is assigned a certain portion of the work. Furthermore, he has been rotated from job to job in the working place as have all of the crew and each and every one of them have performed each and every job several different times. With the help of their instructor and shift boss, they have agreed upon a plan for the prosecution of each day's work.

Considerable discussion among the students naturally follows as to which group is doing the best work. Many questions arise as to why certain work performed by the other shift was done in the manner it was and whether or not some other way would have been better. The instructors, shift bosses and sometimes the foreman are occasionally hard pressed for satisfactory



Learning to operate a slusher hoist and scraper. Equipment is also provided for understanding the principles of mine ventilation

answers to some of the highly intelligent questions asked by these student miners. In fact, all parties concerned with this training program have been much surprised and greatly impressed with the eagerness displayed and the progress made by most of these students. There is little question as to the effectiveness of the program.

As the training program moves along in the drift or the crosscut, the crew becomes more experienced and is thoroughly familiar with the ordinary work cycle of muck and drill, timber and blast. A careful explanation is made to them of the general haulage and hoisting system of the entire mine and particularly the way it affects their mining level and the availability of empty cars and supplies for their specific place. It is shown to them that in order for their particular operation to fit into this general pattern it is necessary that they regulate their work cycle to conform. If they succeed, they receive cars and all of the auxiliary services that expedite their work. If they fail, they have much lost time, their work is hindered and they accomplish much less. All of this is particularly true and vividly brought out when the night shift is placed opposite them. They quickly learn to adjust the round, if necessary, in order to maintain the cycle of "round in and round out" every shift without fail.

Although the stope operations are different in detail the principle is the same. The crew becomes proficient in drilling and blasting; timbering and its many variations such as chute raising, manways and ladders, lagging and flooring, and slides; and the handling of the muck whether by shoveling, slides, or slushers. They soon see that in order to work the stope effectively and make suitable progress the group must be broken down and all of the different operations move along at the same time.

The foreman and shift boss voice the opinion that those men of the crew who think they now know enough about this particular type of stope mining to swing a regular job should probably be given a trial. They suggest, however, that before this is done the attempt should be made to bring this stope's production up to the day's pay level in order to show what will be expected of them as experienced miners. The shift boss, for the next several days, spends considerable time in this stope and shows this crew every legitimate short cut in organization, planning, coordination and group effort that his wise experience affords. Every method of attack, every scheme of betterment and every shortcoming is thoroughly analyzed and discussed by the group as a whole. Usually the response is such that the goal is reached but whether it is or not, much good has been gained and



Preliminary training in operating underground haulage equipment is obtained on the surface

just what this crew has learned and can actually accomplish has been amply demonstrated. Those men who still wish to assume the responsibilities of a full miner's job and whom the shift bosses agree are skilled enough, are given the first opportunity that presents itself. Where possible, they are placed in similar stopes in favorable places in the same mine and under shift bosses who will encourage and assist them in every legitimate way.

#### **Men Should Not Be Rushed Through Their Course**

It goes without saying that not by any stretch of the imagination can these men, at this stage of their training, be considered full-fledged miners. They have probably spent from six weeks to three months in this special training course. Things just simply do not happen within such a short period of time in any mine in the world that would come even remotely close to furnishing a totally green man with fully-qualified miner's experience. Four years is the usual apprenticeship for most of the so-called crafts whose training facilities have all the advantages of close arrangement, constant supervision and normal above-ground conditions of light and accessibility. It is definitely certain that four years or longer will be required to make the master miner. It must be remembered, however, that no attempt is being made in this training program to produce the all-around fully-qualified miner in three months. This is not the aim because it is not felt that this is necessary. As stated before, the different branches of actual underground mining, namely, drifting and crosscutting, stoning, raising and sinking have become so highly specialized that they require specialized miners. This is particularly true with the larger companies where these different types of work

constantly require the labor of several hundred miners. There are drift miners, for instance, who never work at any other type of mining except drifting.

The instruction given in this training program is thought to represent the very best that is possible to devise. It includes the remnant best of many trials over a long period of time and is taught by a group of thoroughly experienced miners especially coached and trained for the purpose. Full miner's pay incentive for the trainee has been provided by the company. Every usual job and detail of the work has been encountered and successfully solved several times. Many unusual jobs or situations have been created so that they might be studied, explained, discussed and subsequently solved. Under these conditions it is believed that fully one year of the normal training and experience of the average green miner has been condensed or crowded into this three-month period. Furthermore, the student has been informed of and has discussed many of the important allied services about the mine that many miners never notice or understand. Best of all, he has been placed in the pleasant (and important) frame of mind that he and his job constitute probably the most vital cog in the whole mining set-up. Therefore, it is not at all out of place to give the more confident and resourceful characters a trial at the same specialized mining they have been practicing.

It is realized, of course, that there must be an opening before the miner can be placed and furthermore, that if the need for miners increases, there is always a tendency to shorten the training period. This is admitted to be one of the weak points of the entire program and cannot be allowed to go too far or the purpose of the entire program would be defeated. It does, however, focus attention on the minimum requirements and it is believed

that the above described three-month training period for stopes is about the minimum for the average trainee. Because of the less diversified nature of the work, drift and crosscut miners require about 60 percent as much training time as stope miners for the same degree of perfection.

#### **Supplemental or Related Training**

Studies under this heading include underground lectures on safety, sampling, ventilation, dust control, contract measurements and geology that are not general but apply specifically to a particular place, by shift boss, foreman or specialist.

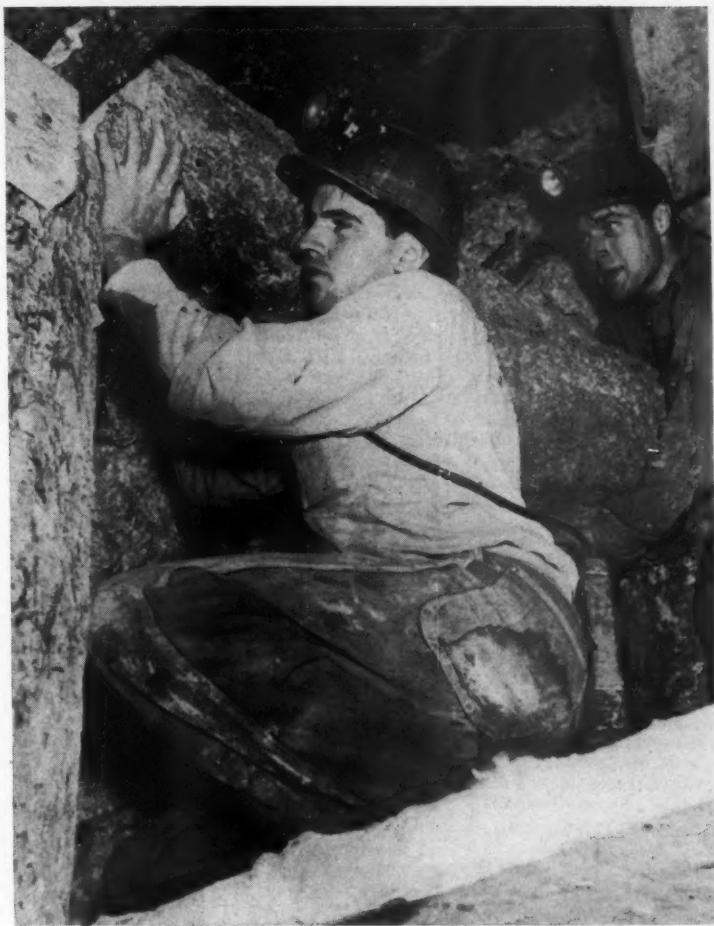
Just how far such explanations and discussions should be carried will depend upon their relative importance and somewhat on company policy. Some of them, such as safety, dust control and ventilation, may be of sufficient importance at that particular place or time, to have a special instructor talk to the group at the underground lecture station for several minutes on certain days.

In following the policy of performing all work as it is encountered, in a student training program, it is definitely certain that some so-called dead work will necessarily be met. Often this detracts from, rather than enhances the program and sometimes dampens the student's interest. Now one of the cardinal principles of good instruction is the creation and maintenance of interest and the related training program can almost always be relied upon to definitely increase interest.

#### **Follow-Up**

In the course of teaching a crew of student miners over a period of three months or longer, instances will happen or breakdowns will occur that will demand special or specific job instruction. For instance, in a large cut-and-fill stope the slusher cable becomes detached and the connections are lost in the filling, no clamps are available short of the supply station and a quickly-thrown eye-splice becomes necessary. This is a situation for specific job instruction by the instructor. This same opportunity might not occur again in the training period and should be taken full advantage of by the instructor, not only to secure the cable to the slusher quickly and well but to instruct the student and to arouse his interest and ingenuity in solving similar difficulties. It builds up the young miner's "stock in trade," gives him confidence in himself and pride in his accomplishments. Many similar instances can be imagined that present fine opportunities for use of specific job instruction.

There is little doubt that lack of proper follow-up is the chief reason for the failure and ultimate collapse



Learning how to timber through practical experience

of many seemingly suitable and easily workable programs attempted underground. Our military strategists all agree that a relatively poor strategy vigorously prosecuted is far superior to good strategy poorly or indifferently prosecuted. Large mining operations are particularly susceptible to such practices. Much time, effort and money are spent in studying, organizing and putting into operation certain laudable practices which later die a natural death because no one in particular is interested. The plan has failed and is roundly condemned. It never had a chance to succeed. It failed not because it was a poor plan but because it was never properly followed up. Shift bosses, foremen, superintendents and even managers are all sometimes guilty of this neglect. Other important matters arise and they turn their attention there, thinking the machinery for the previous problem will take care of it without further effort. There is no follow-up and as stated before, the plan fails.

As an aid and basis for proper fol-

low-up, incorporated in this student training plan is a system of records regarding the student; his work, personal experience and progress as the program advances. It is of the utmost importance both to the trainee and the company. If the instructors under whom he was trained should sever connections with the company or a quick drastic curtailment or shutdown occurs and no record had been kept, no exact information would be available for regulating this student's further training. Furthermore any worth-while training program costs the company considerable money and its measure of effectiveness cannot be properly measured or weighted without suitable records upon which to base judgment and comparisons. These records, their keeping and the manner in which they are used by those in charge of the entire training program constitute part of this important follow-up.

Strictly speaking, the first real follow-up for the Unified Training Program for Beginning Miners comes after the student has graduated. The

placement of the graduate trainee in a favorable working place as a regular miner is undoubtedly the most important single step in the whole set-up both from the young miner's and the company's viewpoint. Here is a man who has chosen a new trade or profession and who is about to launch himself upon this new career. He has spent three months or more in intensive study and training under the best instruction that can be supplied. He has worked hard, is enthusiastic about mining, is proud of his accomplishments and feels fairly certain that he can "hold up his end," that is, hold the job with credit to himself. Nevertheless, he is not too certain, is just a little anxious and, privately, he is hoping that he gets a "break" and "lands" with a good shifter.

Under these conditions it would be most unfortunate for the company and disastrous for the young miner to be assigned to some shift boss who may be unsympathetic with the training program. There can be no doubt of the result. In the extreme case the young miner would certainly be lost to the company and might be lost to the mining industry as a whole. In addition to all of the time, trouble, effort and cost of the training period the company has an unearned wage investment in each graduate miner of about \$3.50 per day or roughly \$250 for the three-month training period. It should also be remembered that the instructor is paid 50 cents above day's pay, or \$8.25, and the shift boss draws \$312.50 per month at the present time.

It is absolutely imperative, therefore, that the follow-up part of the program definitely places each of the graduate miners in a stope or drift similar to the one he served in, preferably in the mine he has worked in but at least in one of similar conditions of ground and temperature; under an even-tempered shift boss wholly sympathetic to the training program and one well known for his capable handling of new miners. Unless this can be accomplished perfectly, it would be far wiser to hold the miner a few more shifts as a student until it could be successfully consummated. Here is one follow-up that must be adhered to or the whole training program fails. The idea of casting adrift either to sink or swim, the product of so elaborate and costly a program is pure nonsense and certainly would not occur under alert and capable management.

### **Training of Instruction Personnel**

The entire training program thus far covered by the reader has pertained entirely to the beginning miner since he represents the ultimate goal or end product, so to speak, of the program. It is realized, of course, that

the staff personnel involved in teaching, instructing and coaching the beginning miner constitutes a very vital part of the program. Upon their knowledge and their ability to impart that knowledge to others rests the caliber of miner produced. It is important, therefore, that we consider the type of man in immediate contact with the trainee and directly responsible for the degree of success of the graduate miner and his personal attainments.

As is usual in picking men for important positions of responsibility we set the ideal as a goal and strive to attain that ideal. The perfect training instructor or training shift boss does not exist for if he did, he would be immediately promoted to higher positions of further responsibility.

There are, however, certain characteristics or basic requirements that all training personnel must have to a fair degree or they are not suitable persons for the instructional staff. *The one fundamental requisite is that the instructor must be thoroughly grounded and well experienced in all branches of the art of mining as exemplified in his particular camp or district.* Answering all questions that may be asked of him goes a long way toward gaining the respect and confidence of the student. *Second*, he must be able to impart his knowledge to others, for without this accomplishment his own personal knowledge does others no particular good. *Third*, he must be sympathetic toward and believe in the whole training program and its ability and capacity for de-

#### **SUMMARY AND OUTLINE OF JOB INSTRUCTOR TRAINING FOR INSTRUCTORS AND SHIFT BOSSSES**

##### **A. Prerequisites for Instructors and Shift Bosses.**

1. Must know the job.
2. Carry out instructions accurately.
3. Must be able to answer—  
 (1) What. (2) Who. (3) Where. (4) When. (5) How. (6) Why.
4. Understand the reasons for things.
5. Interpret what others say or write.
6. Search for facts and ideas needed to accomplish job.
7. Systematize work.
8. Organize information.
9. Draw conclusions.
10. Analyze things.
11. Make plans.
12. Make decisions.
13. Put over a plan.
14. Check results.
15. Search for causes of trouble.
16. Be able to teach others.
17. Possess "knack" to follow-up.

##### **B. Training Outline.**

###### **I. Introduction.**

1. Importance of training.
2. Instructing ability a personal asset.
3. Reasons for training.

###### **II. Training Steps—How to Instruct.**

###### **1. Preparation—Tell.**

- (a) Put worker at ease.  
Instructor to use individualism.
- (b) Find out what worker already knows about job.
- (c) Get worker interested in learning job.
- (d) Put worker in proper position.  
See the job through the same eyes.

###### **2. Presentation—Show.**

- (a) Tell, show, illustrate and question carefully and patiently.
- (b) Stress key points, knacks, tricks.
- (c) Instruct clearly and completely.
- (d) Take up one point at a time, but no more than he can master.

###### **3. Performance—Do.**

- (a) Test worker by having him perform job.
- (b) Have worker tell and show.
- (c) Have worker explain key points.
- (d) Ask questions and correct errors.
- (e) Continue until you know he knows.

###### **4. Follow-up—Check.**

- (a) Put worker on his own.
- (b) Check frequently.
- (c) Designate to whom worker shall go for help.
- (d) Encourage questions.
- (e) Get worker to look for key points as he progresses.
- (f) Taper off on extra coaching.

###### **III. Environment Essentials for Proper Instruction.**

1. Have a plan—Time table—Schedule.  
(a) Accomplishment and how soon.
2. Job breakdown.  
(a) Principal steps.  
(b) Key points.
3. Have everything ready.  
(a) Tools, equipment and materials.
4. Have working place properly arranged.  
(a) Good housekeeping.  
(b) Model for worker's effort.

veloping able miners. In other words, he must be thoroughly sold on the program himself. *Fourth*, he must have the viewpoint of both the young man and the new man learning a trade so varied and difficult as mining and the vast patience and tolerance that is so necessary for successfully teaching such men. He must never lose his temper. *Fifth*, he should have a certain capacity in sizing up men and that elusive but strictly human quality which allows him to get under men's hides, get things done and make them like it. *Sixth*, he should have the physical stamina to personally perform any and all of the many fatiguing tasks in mining. The seemingly effortless motion of the physically-fit master miner in action is a sight to behold and one that arrests the attention and evokes the admiration of all.

It goes without saying that company policy is a very delicate subject in any organization, and the larger the organization the more delicate it is. Policy is wholly and exclusively a function of management and rightly so. However, certain phases of company policy are stressed from the management right on down the line through all the supervising personnel to the miner himself. It is only by this universal emphasis, insistence and cooperation on the part of *all* parties concerned that the proper operating results can be realized.

- a. Universal safety of the workmen.
- b. Proper ventilation of the working place.
- c. Quality workmanship and production rather than quantity.
- d. Proper service to the working place.

Inasmuch as many lifetimes of effort and millions of dollars have been spent to bring the first two of these items to the attention of miners in such a manner that both of them are now almost second nature to all underground men, it seems perfectly proper that instructors and shift bosses should be informed on the company's attitude on these important subjects. The other two seem important enough to be similarly stressed.

### **Job Instructor Training by Special Instructor**

As mentioned before, in general, there are just two ways to perform a task; a right way and a wrong way. One of the strong arguments against the miner-and-his-helper system of training has always been that helpers, with poorly-informed miners, develop into poorly-informed miners themselves. In other words, they learn the wrong way of doing things in many instances and, as the miner says, "To unlearn something is harder than to learn it." This fact is fully recognized and much time and effort have been spent in investigating and recording, in workable and teachable form, the resulting standardizations.

Thorough instruction on the correct and standardized way to do a job which definitely avoids any "unlearning" is one of the outstanding accomplishments of the program.

Further reference to the original outline of the Unified Training Program for Beginning Miners shows it is contemplated that instructors and shift bosses visit the Safety and Mining Exhibit so as to familiarize themselves with exactly what the stu-

dent miner is receiving in pre-production training before he enters the mine.

It goes without saying that the training program as suggested in this article will probably not function perfectly for any length of time either here or in any other camp without several changes. Even though it proved quite adequate for a beginning, it is certain that improvements, changes and additions will be necessary. Because of this and also for the constant improvement of the teaching personnel, it will be necessary to hold frequent lectures, information periods and instruction classes with them for the presentation of material of general value. Individual and personal contact by the foreman with each of them separately will also be found necessary at times. The outline provides for all of these instances as shown in the items listed under pre-production, on-the-job and supplemental or related training.

Considerable diversity of opinion exists as to whether or not any distinction should be made between the student training shift boss and the regular production shift boss. It seems quite unnecessary to make any distinction. Both have their special field and each might prove equally satisfactory in either position. Furthermore, each might have to work in both positions at different times.

### **Acknowledgments**

It is a pleasure for the writer to acknowledge the assistance of several members of the Engineering and Operating staffs of the Anaconda Copper Mining Company. Special thanks are gratefully given to J. W. Warren, assistant chief ventilation engineer, and Earl R. Lyford, foreman, Student Training, for their accurate information, sound suggestions and fine cooperation. They have given much time and effort and have assisted in every possible way.

The aid of Lester F. Bishop, assistant research engineer, and John C. O'Donnell, underground engineer, engineering research department, is much appreciated. E. S. McGlone, general superintendent of mines, has given generously of his time for consultation and advice throughout.

**Editor's Note.**—A complete report of this training program has been made at the request of Mr. John J. Tessari, Special Assistant to the Director, Bureau of Training, Office for Emergency Management, War Manpower Commission, Washington, D. C., and with the permission and full cooperation of the Anaconda Copper Mining Company. This report will soon be available to the industry. The article presented above is abstracted from the full report.



Operating a slusher hoist and scraper unit



A general view of the Mt. Diablo quicksilver plant

## Overcoming Difficulties in Feeding Ore Into a Quicksilver Furnace

*The author explains how the Mt. Diablo Mines "get by" with an unorthodox technique of conveying oxidized and sulphide mercury ores into a rotary furnace*

By WORTHEN BRADLEY

President, Bradley Mining Company

HERE are few difficulties in operating a modern rotary furnace on average quicksilver ore. But a sealed feeder is customary for kilns fired in the orthodox manner—that is, with the burner at the lower end—and this feeding apparatus often gives trouble on sticky ores. This type of feeder consists usually of a "shaking pipe," working back and forth through a hole, the perimeter of which is sealed in some manner. This seal is of various materials: it is sometimes of rubber, and in one improved form it is of spun glass fibre. To maintain an effective seal, the material must be tightened, repaired, or replaced, when it becomes worn. The draft must be kept exactly in balance. If it is not sufficient there is an outward gas leak through the seal; or, assuming the seal is tight, the gas will leak back up through the ore in the pipe.

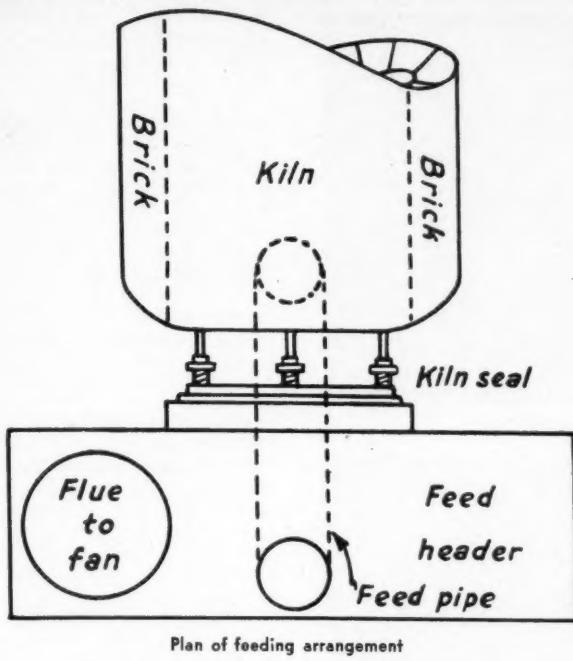
A more serious criticism is that moist ore tends to ball up and become jammed in the feeder pipe. Operators have often wished that the ore could be dropped into the furnace through an open hole, requiring no seal. This is actually done at the Sulphur Bank and Reed mines in California, but for the purpose of this article they do not count. The furnaces at those properties depart from the orthodox and employ "parallel firing"—i.e., fed and fired at the upper end, the gases being withdrawn from the lower end—and this practice will be described in a future issue of *MINING CONGRESS JOURNAL*.

As far as known, simplified feeding is employed with orthodox firing at only one plant: that of the Mt. Diablo mine in Contra Costa County, Calif., described herewith. The procedure there has long been considered

something of anomaly by the quicksilver fraternity, and this article will attempt to explain how Mt. Diablo "gets by" with it.

The brick-lined Mt. Diablo kiln is 40 ft. long and 3 ft. outside diameter; it turns at a speed of  $1\frac{1}{2}$  to  $1\frac{3}{4}$  r.p.m., and its angle of incline is  $1\frac{1}{2}$ -in. per ft. The burner operates at 125 lb. fuel pressure, and consumes 350 gal. of 18 gravity oil per 24 hrs. Since the nominal furnace throughput is 50 tons per day (the 1942 average was 53.5), the fuel consumption is approximately 7 gal. per ton. The fuel is electrically preheated to a temperature of 135 deg. F., and the air to the burner is also preheated. This air is drawn through a pipe coil located in the calcine chamber, below the firebox.

The furnace gases are withdrawn through the feed header at the upper end of the kiln. The gas temperatures are 1,400 deg. F. in the firebox and 900 deg. F. in the flue at the feed header. These temperatures can be easily maintained with a daily feed of 50 wet tons of normal ore. Moisture in the ore stays under 10 percent for most of the year, but ranges as high as 30 percent during winter months. The usual feed is rock dug from the open cut benches, the ore material being silicified and more or less oxidized. It is an altered ser-



Plan of feeding arrangement

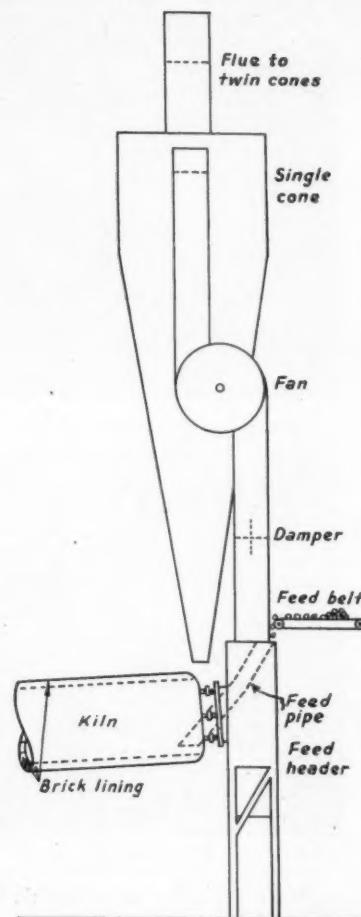
pentine, locally called "silica-carbonate rock." The ore minerals are metacinnabar and cinnabar, with the former predominating. Mt. Diablo is one of the rare mines where the dark sulphide of mercury is the major ore mineral. A trace of stibnite is also found, especially in the higher grade ore.

Occasionally underground material goes through the plant, and this ore ranges from slightly oxidized to rock with a high sulphide content. When, on rare occasions, a straight feed of high sulphide ore is furnace, the input has to be reduced to as low as 30 tons per day in order to maintain temperatures.

The extreme upper end of the kiln is tapered to 20 in. dia., and this tapered end revolves in a steel band which acts as a seal. The band sur-

rounds the 20 in. dia. opening into the feed header. This header is 4 ft. high, 5 ft. wide, and 20 in. thick. It is through it that the ore is fed, a matter to which we will return later in the article. For the present we will follow the gas stream out through the condensing system.

The gases leave the top of the header through a 15 in. dia. hole, and are pulled through a flue of that diameter to the fan. This header-to-fan flue is 7 ft. long, and contains a damper which is normally kept wide open. The 8-bladed steel fan is of 26 in. dia. and 9½ in. face. It is driven, at a normal speed of 1,600 r.p.m., by a 7.5 hp. motor which has a 40 percent downward variation from the normal speed. It is by this variation that the draft is controlled. The fan discharges the gases through a



Ore drops directly into the kiln

flue 11 in. by 14 in. in cross-section and 8 ft. long, into a large dust-collecting cone. This cone is 5 ft. dia. at the top, tapers to 6 in. dia. at the bottom, and is 18 ft. high. From it the gas stream divides and passes through two 18 in. dia. by 8 ft. flues to twin cones, each 3 ft. dia. at the



A view of the feed header and housing for fan



An interior view showing the rotary kiln, the single cone collector, and the triangular dust cart



Looking east over stackline, toward the open-cut



Power shovel and two types of trucks are employed in the open-pit mining operation

top, 6 in. dia. at the bottom, and 12 ft. high.

From these three collectors—the large cone and the two smaller ones—approximately 2 cu. yd. of low grade dust is collected per day. It is wheeled in the dust cart (merely a concrete buggy, with top) a short distance, and hosed out of the cart into a settling pond. The dust in this pond may run 3 lb. quicksilver per ton, but is not considered worthwhile retreating.

Upon leaving the twin cones the gas stream separates into four parts, two 8 in. dia. by 20 ft. flues issuing from the top of each cone. At this section of the plant, the draft reading is 2 in. water gauge. The gas from the four flues passes in parallel through four rows of condenser pipes, nine pipes in each row. The first pipe in each row is 10 ga. black iron; all the balance are cast iron. The pipes are 8 in. dia. and 18 ft. high, and are set vertically. They are connected alternately at top and bottom by cast iron H's and V's respectively. Cooling is aided by six 3 ft. dia. fans, mounted (outside the gas stream) at the warm end of the rows of pipes. At the cool end the gas temperature has been reduced to 125 deg. F. The bulk of the condensation takes place in the third to sixth pipe in each row, reading from warm to

cool. The quicksilver comes down in the form of soot, and 70 percent is worked out as free metal in a mechanical agitator. The balance is recovered in a D retort. Incidentally, the proportion retorted increases during periods of high sulphide ore.

After leaving the condenser pipes the gas stream passes through two wood towers and one concrete tower, through an 18 in. inside diameter wood stave pipe line 600 ft. long, and out a wood stave stack 26 ft. high. Mr. S. H. Williston was kind enough to make one of his stack tests for us recently. His findings were: 62 percent excess air at warm end of condensers; stack temperature, 102 deg. F.; gas volume at stack, 780,000 cu. ft. per day; stack loss, approximately 4 lb. Hg per day.

Returning to the main subject of this article, the feeding of the ore: Pit and mine run rock is dumped into a 40-ton bin and put through a 10 x 20 in. crusher, where it is reduced to minus 2½ in. It is conveyed to a 110-ton crushed-ore bin, located adjacent to, and with its floor slightly higher than, the kiln feed header. At the bin corner toward the header there is a short conveyor: a belt 11 in. wide, with 34 in. between head and tail rollers. This conveyor is driven by a

variable speed motor, and runs normally at 22 ft. per min. The ore is drawn from a 12 in. by 18 in. hole in the bin, is discharged directly into a 7 in. dia. opening in the top of the feed header, and drops into the kiln through a 6 in. I.D. standard pipe. This pipe is 42 in. long and bent just sufficiently to allow the ore to drop 3 in. inside the upper end of the kiln. The lower end of the pipe reaches to a point 3 in. from the kiln floor, and is cut parallel with the slope of the kiln.

The answers to the question, "How is the feeding accomplished without a seal?" seems to lie in this feeder pipe, and in the high draft. The pipe is placed in a way to minimize the chances of it being entered by any of the kiln gas. Equally important is the high velocity of the gas stream as it leaves the kiln and passes through the header. This, of course, is due to the high speed of the fan and the fact that it is located directly above the header and separated from it by only a short length of open flue. There is no "cyclone" or other dust-collecting apparatus between header and fan; all the dust collecting is done beyond the fan. When the system is operating perfectly (and it usually is), there is a slight indraft at the top opening of the feed pipe.

The Bradley Mining Co. operates the plant (with Vic Blomberg as mine superintendent), but cannot take credit for the method of feeding. That system was devised and installed by C. W. Erickson (quicksilver operator, more recently of the Altoona Mine in California), when he built the Mt. Diablo plant in 1935, the year before the Bradley Mining Company assumed the lease on the property.



Condenser pipes where mercury is collected

# Extension of the Reciprocal Trade Agreements Act

*Statement of Julian D. Conover, Secretary, American Mining Congress to the Committee on Finance, United States Senate, May 19, 1943*

THE MINING INDUSTRY of the United States is deeply concerned in the legislation now before you. It is our view that in any extension of the Trade Agreements Act at this time, certain amendments should be made in order to minimize injury to domestic producers and labor.

Operation of this act over the past nine years has been detrimental to the mining industry without any compensating advantages. Necessary tariff protection on important mineral commodities has been lowered, with consequent direct loss to producers, and—even more serious—a loss of confidence in the future resulting in a marked decrease in exploration and development of new ore reserves.

We recognize the importance of sound economic relations with other countries and of developing a healthy foreign trade based on a mutually beneficial interchange of surplus products and services. However, we seriously question the statement that the trade agreements program has resulted in an over-all increase in our export trade, with consequent benefit to the United States as a whole and indirect benefit to the mining industry. This claim would seem to be conclusively disproved by the analysis submitted by Dr. John Lee Coulter to the Ways and Means Committee (pp. 504-508 of the Unrevised Committee Print, April 20, 1943); which shows that, excluding the countries whose trade was interrupted by wars and revolutions, our exports to trade agreement countries in the 1934-1938 period were substantially less and were increasing at no greater rate than our exports to countries with which no trade agreements had been concluded.

The argument is now strongly urged that failure to extend the Trade Agreements Act would be interpreted by other nations as evidencing a policy of non-cooperation, that it might jeopardize friendly relations, and might even interfere with the conduct of the war. This is a matter of inter-

national psychology upon which we shall not attempt to pass. Congress must decide whether renewal of the Trade Agreements authority is essential to retain the good-will of other nations, or whether there are other means equally effective in securing unity of action in the war and cooperation in the post-war period.

If it is the judgment of Congress that a further extension is imperative, then certainly Congress should also consider the manner in which the authority delegated has been exercised, and whether certain clarifying or corrective amendments are now needed. We fail to see how such amendments, to insure that the original intent and spirit of the act are carried out, could be regarded as an unfriendly gesture, or disturb cordial relations with our allies.

Within our own experience, certain serious defects have become evident in the administration of the Trade Agreements Act. These were pointed out in our testimony three years ago,\* and specific amendments to remedy these defects were suggested. Today the need for such amendments is even greater, especially so when we consider the chaotic conditions of world trade and the intense competition for markets that will inevitably follow the conclusion of the war.

Briefly, we believe the act should now be amended in the following particulars:

1. *Congress, representing the people should review and pass upon all Trade Agreements before they become effective.*

The mining industry has held the view that these "agreements" are in fact treaties and as such should be subject to ratification by a two-thirds vote of the Senate. This position was ably set forth by the late Senator Key Pittman in the Senate debate on March 25, 1940 (*Congressional Rec-*

\* Hearings before the Committee on Ways and Means on H. J. Res. 407, Volume 2, January 25, 1940, pp. 1569-1584; hearings before the Committee on Finance on H. J. Res. 407, March 1, 1940, pp. 435-440.



JULIAN D. CONOVER

ord, 76th Congress, Vol. 86, part 3, pp. 3321-3336).

Others have suggested that the act is in reality a revenue act, having for its purpose the regulation of our foreign commerce, and consequently that any agreements should be submitted to the Congress as a whole—either for affirmative approval or for an opportunity to refuse approval.

Certainly, if the Trade Agreements are to be construed as mere executive agreements, the law appears woefully deficient in failing to set up any adequate standards or "yardsticks," to guide the executive agencies in exercising the extremely broad powers delegated to them.

We feel that these powers—which include the power of life or death over important segments of American industry—are too great a responsibility to be lodged in Government bureaus or committees not directly accountable to the people. There should be some check or means of restraint upon excessive zeal in negotiating agreements—in trading away the welfare of our own producers without full comprehension of the facts and without obtaining adequate compensatory benefits.

Within our observation there have been notable instances in which the Trade Agreements committees have failed to make full investigation of the facts before making important

tariff concessions; where their action has given the definite impression of being arbitrary, and has not evidenced the "infinite care and caution" which are claimed to be an inherent part of their procedure. The reductions in the zinc and cadmium duties in the Canadian Trade Agreement, as described before this Committee and before the Ways and Means Committee in 1940,<sup>†</sup> are a case in point. In the Venezuelan negotiations, which resulted in reducing the excise tax on petroleum—to the detriment not only of oil producers but also of the bituminous and anthracite coal industries—an unwillingness to discuss certain fundamental questions was apparent.<sup>‡</sup>

In our judgment the importance of these contracts with foreign powers requires that they be submitted to Congress for approval, as is done in practically all other countries. The people of our country should have an equal right to study the recommendations for tariff concessions resulting from the negotiations, to present their case to their own representatives, and through them to pass upon any proposed commitments which so vitally affect their interests.

We are not able to subscribe to the State Department's view that "a demand for Congressional action on trade agreements is a demand for abandonment of the whole program." This is equivalent to saying that the elected representatives of the people are not capable of weighing facts and passing same judgment on tariff matters. It is a challenge to the intelligence and integrity of the Congress.

Our position has been that any agreement which cannot stand up under Congressional review can hardly be in the best interest of the country. A provision for Congressional approval not only will restore the orderly process of democratic government, but will serve to insure proper care and concern for domestic producers throughout the process of negotiating an agreement.

2. *The law should specifically provide that our negotiators may make tariff concessions on any commodity only to that country which constitutes the principal source of imports.*

The purpose of such a provision is, obviously, to make the trade agreements as nearly bi-lateral or *truly reciprocal* in character as is possible under the unconditional most-favored-nation treatment. It would merely put into effect the policy explicitly set forth by the then Assistant Secretary of State, Francis B. Sayre, in 1934 (Finance Committee hearings on H. R.

8687, April 27, 1934, p. 114), when he said:

"The whole purpose of the program of trade bargaining is this: To restrict the commodities covered in the agreement with any specific country to commodities of which that country furnishes the chief source of supply of importation into the United States. Then, under our most-favored-nation agreement, to generalize those rates to other countries."

Unfortunately this policy has not been adhered to, and numerous important concessions have been made to countries which are only minor sources of supply. Examples in the mineral field, in addition to zinc and cadmium, include cobalt oxide and certain ferro-alloys in the Canadian agreement, zinc oxide in the Mexican agreement, and lead oxide and silica sand in the Belgian agreement. In several of these cases, the trade agreement country to which the concession was made supplied no imports whatever to the United States.

Concessions thus made have been extended gratis to other countries from which no concessions are received in return. Frequently the major benefits of a tariff reduction—entailing the major injury to American producers—have gone to these other countries, from which we have received no reciprocal benefits. Under these conditions it is not surprising that the impression has spread that the trade agreements program was being used primarily as a vehicle for general tariff reduction, rather than a means of bargaining for advantageous concessions on our own surplus products.

To insure adherence to Congress' original intent, the trading away of concessions to minor sources of a commodity should be barred, and specific provision made to limit our concessions to the country which is the major source of imports, and which can afford to trade us something worth while in return.

3. *There should be definite provisions in the law making mandatory the application of the "escape clauses," and providing for adequate review and correction of injury to domestic producers.*

This subject was thoroughly discussed in the testimony presented by ourselves and by representatives of the zinc industry three years ago, to which I have previously referred.

Experience of the zinc industry with the much advertised "escape clause" of the Canadian Agreement was bitterly disappointing. This industry's case fulfilled completely the requirements for the granting of relief. The major benefits of the duty concessions were received not by Canada, the country to which they were granted, but by other countries, from which our imports greatly increased. The industry was seriously injured by

such imports, by the depression of prices and wages, and by a loss of confidence in the future which brought exploration for new ore-bodies almost to a standstill. This last factor has contributed directly to a serious situation today in the supply of one of our most essential war metals.

Despite a thorough, painstaking presentation of the facts, supported by careful studies by the U. S. Bureau of Mines and by the zinc expert of the Army and Navy Munitions Board—a record which so impressed the chairman of the Finance Committee that he publicly stated he thought a mistake had been made—the State Department took no action to remedy the situation. As a matter of fact, any possibility of relief under the escape clause was effectively barred last year when a Trade Agreement was concluded with Mexico, freezing the reduced rates of zinc duty (and, in addition, making a similar duty cut on lead, which is a joint product of our zinc-lead mines).

Out of the 1180 reductions in duties under the trade agreements to date, we know of hardly a single instance in which the escape clauses have been successfully invoked. Failure to apply them even where clear-cut need has been shown has been an outstanding weakness of the program. It should be corrected by a mandatory provision of the law.

### **Numerous Conditions May Require Remedial Action**

There are also many other conditions, not covered by the escape clauses, under which revision of agreements may be needed to prevent injury to our own producers and workers. Thus, the depreciation of foreign currencies; discriminatory trade practices of other countries; lower production costs elsewhere versus increases in our own costs resulting from the "social gains" which have been adopted by our government; the competition of foreign cartels not inhibited by anti-monopoly laws, and the dumping of excess production (such as has been frequent following a war) are some of the factors that may call for remedial action, either in revising the agreements entered into, or in limiting the "generalization" of concessions to other countries.

Insofar as possible, specific remedies for such conditions should be provided in the law. Thus the flexible provision (Sec. 336) of the Tariff Act of 1930, permitting tariff adjustments where needed to equalize costs of production at home and abroad, should be restored and made effective. At present this provision has been nullified as to all commodities which have been included in trade agreements. Similarly the Anti-Dumping Act of 1921 should be made mandatory rather

<sup>†</sup> See references previously given; also hearings before Committee on Ways and Means on H. J. Res. 407, Volume 3, January 29, 1940, pp. 2053-2057; January 31, 1940, pp. 2416-2429; hearings before Committee on Finance on H. J. Res. 407, March 1, 1940, pp. 440-465.

<sup>‡</sup> Hearings before Committee on Finance on H. J. Res. 407, March 5, 1940, pp. 625-642.

than permissive. The discretionary authority to suspend tariff concessions to third countries which discriminate against American commerce should be supplanted by a definite provision of law, under which the most-favored-nation benefits would be extended *only to those countries which do not in fact discriminate against our products.*

Finally, there should be some provision whereby industries injured under a trade agreement might obtain court review, or review by a non-political fact-finding tariff agency, and upon a finding of substantial injury (if the case does not fall within the scope of the escape clauses), negotiations should then be reopened with a view to withdrawing or modifying the concession.

#### Sound National Policy for the Future Demanded

Thus far the trade agreements have operated in a period of generally expanding business and rising prices, which has lessened the impact of our tariff concessions. With the intensified foreign competition that is certain to follow the war, it seems inevitable that some of these concessions will bring serious distress and unemployment, unless means of obtaining prompt and certain relief are available.

This applies particularly to an industry such as mining, which is governed by the physical facts of ore occurrence. Mines cannot be moved to other locations nor converted to the production of other goods. They are generally in isolated or semi-isolated localities and are usually the sole support of their communities. For the most part foreign mines have substantially lower costs of production, due to higher grades of ore, lower wages and fewer legislative requirements adding to the costs of operation. Our modern cost-reducing machinery is equally available to the foreign mines, which threaten to put many of our domestic producers out of business when the war is over.

Vitally involved also is the question of national self-sufficiency in regard to some of our most important minerals and metals. In the present crisis one of our major difficulties has been to secure adequate production of the mineral raw materials essential to national defense and the prosecution of the war, and we are not yet out of the woods by any means. Sound national policy for the future demands the maintaining of our mining industries in healthy condition, and this cannot be accomplished under a program which trades away needed tariff protection without proper safeguards and without adequate recourse in case of demonstrated injury.

The policies determined upon by Congress in the pending legislation will vitally affect the future of important branches of mining in this country. We believe that amendments to the act such as we have proposed

are to the best interests of our country and are fully in keeping with the spirit of the reciprocal trade agreements program. We solicit your earnest consideration of these amendments.

#### Bureau Adopts New Method for Classifying Ore Reserves

A new method for classifying ore reserves has been adopted by the Bureau of Mines and the Geological Survey as a means of providing a more comprehensive picture of the Nation's mineral resources.

The two Interior Department agencies, which have cooperated in the discovery and exploration of millions of tons of war minerals in the past four years under the Strategic Materials Act, will use the terms "measured ore," "indicated ore," and "inferred ore" in defining the extent of mineral deposits, Secretary Ickes explained.

The following definitions will govern the use of the three terms:

*Measured ore* is ore for which tonnage is computed from dimensions revealed in outcrops, trenches, workings, and drill holes and for which the grade is computed from the results of detailed sampling. The sites for inspection, sampling, and measurements are so closely spaced and the geologic character is defined so well that the size, shape, and mineral content are well established. The computed tonnage and grade are judged to be accurate within limits which are stated, and no such limit is judged to differ from the computed tonnage or grade by more than 20 percent.

*Indicated ore* is ore for which ton-

nage and grade are computed partly from specific measurements, samples, or production data and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement and sampling are too widely or otherwise inappropriately spaced to outline the ore completely or to establish its grade throughout.

*Inferred ore* is ore for which quantitative estimates are based largely on broad knowledge of the geologic character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition for which there is geologic evidence; this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic evidence of their presence. Estimates of inferred ore should include a statement of the spacial limits within which the inferred ore may lie.

Officials of the Bureau of Mines and the Geological Survey said the uniform method of describing ore reserves will prove beneficial to both agencies and will be helpful to mining men and the many Federal agencies interested in the development and utilization of domestic minerals for war production.

#### "Log-Rolling"—Realistic Version

ON FEBRUARY 21 the American Forum of the Air broadcast over the coast-to-coast network of the Mutual Broadcasting System a discussion of the "Reciprocal Trade Agreements." Participants in this broadcast were Representative A. Willis Robertson (Dem., Va.), Representative Bertrand W. Gearhart (Rep., Calif.), Mr. Robert H. Patchin, vice president, W. R. Grace and Company, and Dr. John Lee Coulter, former member of the U. S. Tariff Commission and recognized for his authoritative studies of tariffs and foreign trade.

At one point the subject of log-rolling was brought up between Mr. Patchin and Dr. Coulter:

DR. COULTER: That hasn't anything to do with what we are saying here. We have had the trade, and still have it. I was interested, Mr. Patchin, in your observation about log-rolling.

MR. PATCHIN: Don't you know what it is?

DR. COULTER: Yes, sir; it is Yankee trading; and I know you are opposed to Yankee trading. It is also reciprocity. That is, we exchange advantages. Reciprocity is the dictionary definition of log-rolling. But I left the Tariff Commission, when the Act was passed, and went over to the State Department for a year and sat on the Board for Reciprocity Information, where I saw real honest-to-goodness log-rolling. These Congressmen are babes in the woods compared with the log-rolling that went on there in the State Department—and I stayed a year, through the first 18 agreements. I saw at least twice as much log-rolling as you ever could see up on the Hill; and incidentally, I was with the Tariff Commission during the whole passage of the Act in 1930, so I saw log-rolling in both places.



Spraying molten metal onto the worn groove of a sheave mounted in a lathe

SINCE STEEL or iron sheaves are not easily obtained these days, it behoves everyone to make all sheaves or drums last as long as possible. Frequently old sheaves can be reclaimed and kept in use by building up the worn grooves. A common method for building up worn sheave grooves is to deposit metal in the worn grooves by either arc welding or by metal-spraying. Where the sheave groove is badly worn, flat spots or places of uneven wear can be built up by welding and then the welding arc, or the metal-spraying gun, used to apply the final layer over the entire wearing surface.

The use of too soft a material, such as cast iron, is often the cause of undue wear of sheaves. Originally soft sheave grooves built up with a hard metal have given as much as five times the original wear. Hence, the reclaimed sheave might be a decided improvement over the new. Here, too, is proof that harder sheaves, such as manganese, might well be economical in the long run. A long-wearing sheave saves more steel than is at once apparent, for in addition to saving precious sheave metal, it is much easier on the rope than is a sheave of softer material.

However, wire rope in itself can be a needlessly destructive element to sheaves. Ropes which tend to twist, squirm, or rotate as they pass over sheaves cause far more rapid sheave-groove wear than where such twisting

is absent. Because of the elimination of torsional stresses in preformed rope, this type of rope does not tend to twist or rotate in sheave grooves and thus reduces groove wear as well as rope wear. It has long been recognized that the use of hard sheaves, with preformed wire rope, will effect pronounced savings in replacement or reclamation.

Approved methods of building up worn sheave grooves by arc welding and by metal-spraying, with advantages and disadvantages of each process, can be briefly stated as follows:

#### Arc Welding

##### How to Apply

1. Use an electrode that is suitable for depositing on the particular metal of which the sheave is made, and where practical, select an electrode that will give a hard surface without heat treatment. With a steel sheave use a manganese-steel electrode or a self-hardening electrode, deposited in a layer not more than  $\frac{1}{8}$  in. thick. Where the wear is greater, fill in with a carbon-steel electrode before depositing the final layer of hard metal.

2. Apply the metal by the skip weld method to minimize distortion.

3. Finally, true up the groove.

##### Advantages

1. Can be applied to sheaves having even or uneven wear.

# Reclaiming Worn Sheaves

By F. L. SPANGLER, M.E.  
Chicago, Ill.

2. Can be performed without removing the sheave, if necessary.
3. Many users of wire rope are equipped to build up sheaves by welding.
4. Deposit is very dense, contributing to long wear.

##### Disadvantages

1. Arc weld deposits on cast iron sheaves will require heat treatment if hardness is desired. This is not true of steel sheaves.
2. The heat of welding tends to distort the sheave.

#### Metal-Spraying

##### How to Apply

1. If uneven wear is present, build up to uniform contour by welding or by truing up on lathe.
2. Prepare surface by blasting with sharp steel grit. After blasting keep surface clean. Do not allow hands to come into contact with the surface.
3. Apply metal by rotating sheave in lathe with spray-gun attached to tool post. Use 1.2 carbon wire.

##### Advantages

1. Can be used to give hard surface to cast iron sheaves as well as steel sheaves.
2. Does not distort sheave if applied as directed above.
3. Requires no truing up of sheave groove after application.
4. Deposited metal is capable of absorbing rope lubricant, thereby retaining oil film on surface.
5. Wearability of hard deposit increases life of sheave and rope.

##### Disadvantages

1. Very few users of wire rope have the equipment for metal-spraying and must rely on job metal-spray shops to do the work.
2. Since metal-spray is applied in a uniform layer, it is not suitable for building up worn spots or corrugations.

# The Manpower Program

*Because of the very nature of manpower, any interference with it, regulation of it, or restrictions to it are subjects of great concern to each of us. This concern has created the Declaration of Independence, the Constitution and the Atlantic Charter*

**M**ANPOWER is the skill, knowledge, habits and attitudes of human beings translated through effort and energy into productiveness. It is a deeply personal matter. It is you—it is I! It is one factor in which we are all interested and it is the item that receives our greatest attention.

We are temporarily disturbed over the loss of material items and facilities which reduce our comforts and standards of living, but soon become adjusted and realize we can get along without them as well as did our forefathers. There is even a grim pleasure in that realization.

Start telling us what we are to do with ourselves, however, and that's different. Start changing me as an individual and what I do with myself and I've got my own ideas about that. And yet mobilization and utilization of the country's manpower in time of war does just that. It is an unpopular activity.

What makes the whole activity doubly difficult is that everyone considers himself an expert in human relations and a reliable judge of human beings and their abilities. We all, therefore, have definite ideas on how manpower should be mobilized and utilized and those ideas are influenced by personal concepts, experiences and interests. This is one responsibility we are not readily willing to delegate to others.

It makes little difference what occupations are on the essential list. If my activity is not on there, the list is wrong, the method of setting it up is wrong. The individuals who prepare it are incapable. If the Selective Service System puts me in the armed forces when I do not believe I should be or the Army puts me in a branch of the service which I do not like or which, in my opinion, does not make proper use of me, the whole system is wrong.

Any manpower program therefore, must be interpreted in terms of whether human beings with proper qualifications are in the right places at the right times and in sufficient numbers to win the battles and the war, to provide the equipment and supplies needed by our troops and those of our Allies, to maintain the home front and

to support a minimum civilian economy.

Those of us responsible for doing this job expect to be criticized continually by individuals and groups who disagree with methods used. There will always be those who are interested only in their particular activities and who have neither a concept of or a concern with the problem as a whole. We march ahead, however, with the firm conviction that each individual or group must sacrifice for the good of all and that none can remain unaffected by the war.

It is a matter of simple arithmetic that if all activities received all the manpower their representatives state is needed, there just is not enough to go around. Priorities for manpower therefore, must be established and some activities will suffer or even cease to exist. Let's face that fact and face it squarely. This is war! It is a global war! We are in it and we'll win or lose it by the degree to which we mobilize manpower successfully.

## **Manpower Commitments**

During this year four major commitments have been made in national manpower planning:

1. We must provide an armed force of nearly 11,000,000 persons.
2. We must provide an industrial army of about 18,500,000 persons to produce munitions and to service supporting activities.
3. We must provide the necessary manpower for agriculture of 9,000,000 persons, and in addition, some 3,000,000 more during the summer peak.
4. We must maintain the civilian economy though obviously at a Spartan level.

**Progress Shown**—In spite of public reference to the "manpower muddle" the American people have done a remarkable job. Tremendous progress has been made in achieving these goals. Over 8,000,000 persons are now in the armed forces. There were little more than 2,000,000 at the time of Pearl Harbor. Over 17,000,000 persons now in direct and supporting war industry; there were no more than 7.5 million at the time of Pearl



**By BRIG. GEN. WM. C. ROSE**

Chief, Executive Services  
War Manpower Commission

Harbor. In productive agriculture, workers in 1942 were 28 percent above the 1935-39 average, and greater than any other period. And finally, we have maintained the civilian economy at a high level, and the American standard of living has not yet been seriously curtailed.

This record is a tribute to the mobility of the American population and to the adaptability of American management and American workers. It is a tribute also to the capacity of our democratic American institutions to make the adjustments necessary for a total war effort.

## **We Have an Even More Difficult Job Ahead**

The readily available resources are gone. From now on the situation will be increasingly tight—35 areas have been designated as critical labor shortage areas in Group I. One hundred and seven areas, in Group II, are designated as labor stringency areas, a number of which are expected to go into Group I within the next few months. There are critical shortages in most occupations and increasing shortages in common labor in some areas. Certain industries which are isolated or in which the work requires extreme physical stamina, such as lumber, mining, etc., are the first to experience these difficulties. As production expands, of course, additional workers are hired and as military inductions continue to deplete the labor force, especially of men, there is a general trend toward increasing tightness in the labor force.

National aggregates and national manpower resources do not, however, portray the real nature of the manpower problem. It is *distinctly local in character, in requirements, and to a very great extent, in supply*.

None can afford to sit back in complacency because of essentiality of activity or job. No one should have any

sense of "protection" by any Selective Service regulation or ruling, because our problem resolves itself into a matter of intelligent division and distribution of manpower among needs according to their importance to the war.

An activity can be essential without the individual in it being essential. Less and less can able-bodied men be considered as essential to essential activities other than the armed forces. While having done a good job so far, we have not yet begun to use women to their full capacity in this war effort. Those who are slow to do this will soon find so-called "protection" of their male employees dwindling rapidly, and that applies to your industry even though we well recognize that coal mining has never used women. If heavy steel and shipyards can find places for women in their production lines, can the mining industry do less?

### **How is the War Manpower Commission Tackling the Job?**

Our objective is: *The establishment and maintenance of a strong, integrated manpower administration at the local manpower market level so that complete mobilization and utilization of human effort will be attained in terms of wartime needs.*

This is the keynote for all of our thinking on manpower activities and we are mobilizing the attention and abilities of all agencies of the War Manpower Commission for the rapid realization of this objective.

The essential parts of our Manpower Program are:

#### **1. The accurate determination of manpower needs.**

These needs must be identified in terms of: establishment, both plant and farm; military; war industry; supporting war industry; essential civilian activities; as well as occupations; time and quantity; locality; and area.

The importance of this step cannot be over-emphasized. It is basic to planning and policy formation. Upon the accuracy with which it is done depends the soundness of our judgments.

#### **2. The accurate determination of manpower supply.**

Supply must be identified in the same terms as manpower needs. The same breakdown is to be used. While we realize fully how much more difficult it is to identify supply than it is to estimate need, we cannot at any time relax our efforts to become as specific as possible. *Supply* is, however, more mobile and changing than is *demand*.

Manpower to meet all needs comes from a common labor pool and that pool must be so controlled that it may be divided properly among competing demands and thus avoid confusion in recruiting and placing. If the individual is listed as potential labor sup-



**Absenteeism in coal mining is a major manpower problem**

ply in the estimates of the armed forces, war industry, agriculture, etc., the result is obvious.

3. The development and inauguration of policies, procedures and actions required to make the supply available and to get it to the point of need at the right time and in the right quantity.

In terms of manpower needs and supply we must have adequate plans which will do what analysis of these figures indicates must be done for complete mobilization and utilization of manpower.

To illustrate what is meant by policies, procedures and actions you will now find:

All-over recruitment and placement plans;

Employment stabilization programs which include the exercise of hiring controls;

Employment stabilization in non-ferrous metals and lumbering activities;

Recruitment, training and employment of women workers;

A manpower utilization program; Coordinated action to reduce absenteeism;

Plans for employment of aliens in the national war industries;

The list of non-deferrable occupations;

The minimum wartime work week;

Selective Service regulations;

Plans for concentration and curtailment of civilian activities.

This is by no means a complete list of policies, procedures and actions already in use by the War Manpower Commission. It does, however, indicate the type of items which are included under this phase of our program.

4. The establishment of an adequate organization to administer the policies, procedures and actions of the

War Manpower Commission at all levels.

This is not to be thought of only in terms of the activities mentioned earlier. All Government and private agencies which have the facilities and the personnel to help in doing the manpower job must here be considered. Furthermore, throughout our entire organization we provide for the full use of the invaluable advice and assistance of management and labor.

Here I think I may with pardonable pride quote a recent resolution of outstanding representatives of Management and Labor, giving their views as to the result of our efforts:

"We wish to express to both you and the Management-Labor Policy Committee and particularly you the very wholesome appreciation of the splendid work that the Joint Committee consisting of representatives of agriculture, labor and industrial management, has been doing in working with you and you working with them. We know of no institution in Government where there has been a more cooperative and constructive structure than the one created by you here for the enunciation of policy and the disposition of problems affecting the national war manpower situation."

"We want to extend to you and to your committee our compliments for the spirit of justice and fairness that has manifested itself in the conduct of the affairs of this committee."

"The establishment of this committee demonstrates the practical way in which democracy can rise to meet its most difficult situations."

The signers of the resolution were:

Mr. Philip Murray, president of the CIO.

Mr. William Green, president of the AFL.

Mr. Ed O'Neal, president of the American Farm Bureau Federation.

Mr. James O. Patton, president of the Farmers' Union.

Mr. Albert A. Goss, master of the National Grange.

Mr. Eric Johnston, president of the U. S. Chamber of Commerce.

Mr. Frederick Crawford, president of the National Association of Manufacturers.

5. The determination of the action

that can be completed at each level of the organization.

This means that we must determine what can be done at each level of the organization without reference on up for further clearance or approval. Everything that it is possible for local Selective Service Boards and the U. S. Employment Service neighborhood offices to complete must be completed by them. Only a small part of what they do should be referred to an area or state office for further action or approval. In turn, a small part of what the state or area offices do should be referred to the regional office. And, finally, that which has to come to Washington for final decision should be an irreducible minimum.

### ***The Accurate and Current Measurement of Results***

It is essential that we perfect a system by which to measure regularly whether the labor supply is being made available at the point of need at the right time and in the right quantity. We must know likewise whether the labor is being kept at that point and utilized to its fullest extent. The soundness of changes in and adaptations of our program will be in direct ratio to the accuracy with which we measure results.

We are going to do this job and do it despite interference and what appears to be unsurmountable difficulties. We are asking the help of all. We need the help of Congress, management, labor, Government agencies and the general public. I am happy to report to you that we sense an increasing desire on the part of all of these bodies to help. This is a result of gradual realization of the job that has been done by us despite tremendous handicaps. We'll get this job done if the people of this country want it done and we are convinced they do. We are in the war to win it and the complete mobilization and utilization of manpower is required for a complete victory. The War Manpower Commission has that responsibility. Congress, the people, other Government agencies, management, labor and the public know this in their hearts. They are beginning to say so.

I have purposely avoided discussing the particular problems of the coal mining industry, preferring to leave these to questions and answers further on.

On behalf of the Chairman of the War Manpower Commission in particular, and for the entire Commission as a whole, I do, however, wish to state that we welcome an opportunity to meet with representatives of industries such as yours to frankly discuss our mutual problems. It is obvious that we in the War Manpower Commission cannot suggest a solution to all of your manpower problems; there are too many considerations involved.

I will, however, either answer or find the answer to those which are properly answerable by us, or state quite candidly that we have not the answer if such should be the case.

### ***Questions and Answers on Man-power Problems in the Coal Mining Industry***

**Q. Is Executive Order No. 9301, establishing a minimum war-time work week of 48 hours applicable to the coal mining industry?**

A. We consider that Executive Order No. 9301 establishing a minimum 48-hour war-time work week does apply to the coal mining industry, wherein the War Manpower Commission thus far has limited the application of the order to some 39 designated critical labor market areas and to the logging, non-ferrous metal mining and iron and steel industries on a nationwide basis.

On May 4, the Solid Fuels Administrator for War ordered a mandatory 42-hour work week for all coal mines in his custody. Any extension of the order that we might undertake will be worked out in consultation with that office.

**Q. What is the effect of the President's "Hold-the-Line" order—Executive Order 9328—on the coal mining industry?**

A. It is anticipated that the recent War Manpower Commission directive which forbids workers in essential activities to shift to a non-essential employer or from an essential job to another essential job at a higher wage rate will tend to prevent further unnecessary depletion of the industry's labor force.

**Q. Can the coal mining industry secure preferential treatment from the Selective Service System of such a character as to eliminate withdrawals from the industry?**

A. It is considered unwise to extend occupational deferment in the coal mining industry further than is already provided by presently issued occupational bulletins. Blanket deferment for workers in the coal mining industry or any other industry, with the exception of agriculture, is specifically forbidden by statute. Moreover it is neither desirable nor necessary at the present time. The coal mining industry along with the shipbuilding, aircraft and munitions industries, must continue to contribute men to the armed forces. Mine operators should be encouraged to use manning table and replacement schedule procedures to insure the orderly withdrawal of coal mine workers into military service.

**Q. Is it possible to recall skilled mine workers from the armed forces?**

A. The War Department has established procedures to permit the orderly release of soldiers over 38 years of age for essential war jobs, upon appli-

cation of their former employer. Operators should be encouraged to offer employment to soldiers over 38 years of age with previous mining experience, so that they may request furloughs from the Army.

**Q. What has been the effect of the 42-hour work week on the coal mining industry?**

A. Several effects of the longer work week in coal mining are already apparent. Although the 42-hour week permits more efficient utilization of the employed work force, the industry's labor requirements have not been substantially reduced. Operators continue to report considerable critical labor shortages impeding production. Coal production, however, has generally exceeded the weekly production rate that the Office of Solid Fuels Coordinator for War indicates is necessary to meet 1943 requirements. In addition, increased earnings as a result of overtime pay for work in excess of 35 hours has tended to curtail out-migration from the industry.

**Q. What is the War Manpower Commission program for reducing voluntary absenteeism in the industry?**

A. The War Manpower Commission has recommended an intensive educational program, preferably in cooperation with mine labor-management committees to stress the important role of coal production in the war effort and the necessity for elimination of absenteeism. In addition, we recognize that there can be no single solution to the problem of job absences. Absences result from underlying difficulties, which vary in nature and degree from area to area and from mine to mine. The actual resolution of the problem is through application of specific remedies to particular difficulties. Joint action is required of labor, management, the community, and Government focused on the local, particular conditions that lead to absenteeism.

**Q. Has the United States Employment Service recruitment for the coal mining industry been effective?**

A. The bulk of hiring in the industry continues to be done at the mine or through the union—the industry's main recruitment channels in the past. USES recruitment is also limited by the distance of many mines from the local Employment Service office. Nevertheless, mine operators are placing increasing reliance upon the facilities of the War Manpower Commission in hiring. The War Manpower Commission is currently engaged in an intensive recruitment campaign to transfer qualified miners from areas which report a surplus to the western coal mines where the need for labor is most acute. More than 600 workers were recruited during January and February, 1943. The unwillingness of employers to pay transportation expenses, however, has hampered the recruitment of workers from other areas.

# Public Relations In The Coal Mining Industry

*All branches have the responsibility of understanding each other's problems and objectives so as to contribute maximum benefits to coal's growing field of consumers*

**I**N DISCUSSING public relations as applied to the coal industry, it is necessary to go back a few years in order to get a clearer picture of today's problems. It is difficult to remember all the important events in the recent history of the coal industry and it is still harder to remember the order in which they occurred, but let us look back and add up what has happened. On the basis of these facts let us determine, if possible, what public relations can mean to this industry in controlling its own destiny.

For generations the giant coal industry sat on "top of the world"—its problems were all internal. There were only two kinds—production problems and labor problems—but the shadow of competition from other fuels began to appear. Soon these other fuels—we flattered ourselves by calling them "substitute" fuels—began taking a larger share of our market each year until the tonnage loss became serious. The encroachment of these other fuels resulted in loss of interest in coal on the part of the public, the press, the equipment manufacturers, the retail dealer, the builder and the architect. Even many among our customers, who for one reason or another could not change, looked longingly at these fuels.

Before the lights started going out all over Europe the industry was faced with a situation where *production exceeded demand*. While Hitler was starting his blitzkriegs through Poland and the low countries, the seeds were being sown that would create a change in the American coal industry. Today that change is here. Today we are faced with a *demand that is taxing our every effort to produce enough coal to meet it*.

In a sense, coal today is again the king it was in that era not so long ago when there were only two recog-

nized problems—production and labor. Today, coal has the choice of repeating the history of the twenties and thirties that I have just outlined, or it can have learned during the 20-year period that its problems are not only those of production and labor. It must no longer blind itself to the fact that it has a problem in meeting and satisfying consumer requirements. Public relations is vital—because within its scope come all those things that mold the opinion, favorable or unfavorable, of coal's consumers.

I won't attempt a professional definition of public relations because there are so many concepts as to its meaning—but to me, it consists of "90 percent of what you do—10 percent of what you say you do." Nevertheless, whatever is used as a definition must include that the objective of public relations is "to make people want to do business with you."

This industry has all the basic elements needed to undertake a successful public relations program. Many of these elements will have to be taken out of obscurity and dusted off a bit because of past neglect, but it is my prediction that when the coal industry uses all of the elements it has at its command, "people will want to do business with it."

## ***Objective is Better Service for the Consumer***

For instance, so many of the men in the industry represent the highest type of thinking and ability on production that can be found anywhere. In this industry are also to be found men of exceptional abilities in the development of coal burning equipment. This industry does not lack for excellent sales, service and merchandising men. Seldom have all of these forces been coordinated in focusing their



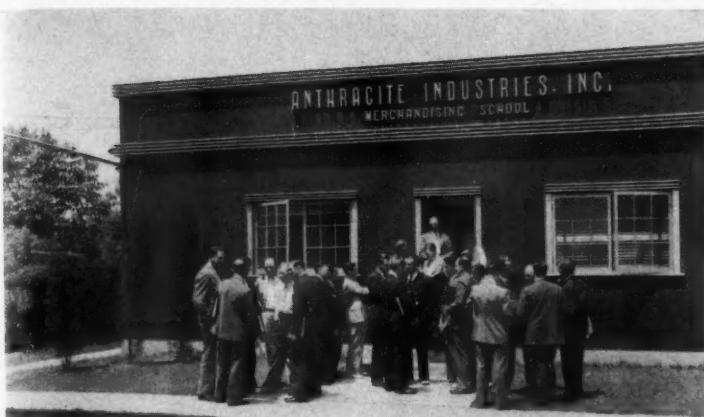
**By E. H. WALKER**

Director, Public Relations  
Anthracite Industries, Inc.

effort toward the single purpose of benefiting the consumer. Consumers, after all, are "people"—they are the force that will either make or break our industry. Lack of cohesive effort on the part of production, research, engineering and merchandising men in our industry has resulted mainly because there has existed a lack of understanding of each other's problems and objectives as related to the whole. The best coal produced is of little use to the public, if burned in poor equipment and, similarly, the best piece of equipment in the world is of little value, if it must burn poor coal. Even good coal and good equipment are valueless as a team without the necessary service and merchandising to tell people in such a way that they will want to have it and after they get it, to teach them how to use it. So here we are right back again to the objective of public relations—"making the public want to do business with you."

Therefore, I should like to stress that this industry or any industry must coordinate the thinking of all its branches and direct it toward that one objective if that industry expects the public to want to do business with it.

Carrying out this thinking of "cleaning our own house first," the relationship between every member of the industry is also of paramount importance insofar as public opinion is concerned.



Group of students attending merchandising school

cerned. The thoughtless action of some small colliery operator, of a distributor, or a dealer, truck driver, or service men can register an adverse opinion of all coal as a fuel in the public mind. Grievances, that start as minor, are built up to major proportions in the mind of the public because it is impossible with today's super system of communication, to hide news from the public. We Americans have been trained to be news conscious and we read more newspapers and magazines and listen to more radio programs than any people in the world. Because bad news is unusual it is given much greater circulation than good news. This is the reason why it is so easy to make a bad reputation and so difficult to establish a good one.

#### **Much Progress Made in 25 Years**

Let us look back again over the last 25 years to the progress in the mining and preparation of coal and at the strides made by coal burning equipment manufacturers. Both have made excellent progress, yet they made this progress while working independently. Isn't it logical to believe that if these two groups of engineering minds were coordinated they could make even greater progress? Such coordination of engineering skills would lead to the development of superior burning equipment, more convenient and more economical home heating and would give us a story that would "make people want to do business with us."

With this thought in mind, it might interest you to know that the Anthracite Industries Laboratory, located at Primos, Pa., is now spending several hundred thousand dollars yearly in coordinating the efforts of our industry with equipment manufacturers in improving existing equipment as well as developing new equipment so that anthracite and anthracite-burning equipment will be well qualified to take its proper place in the post-war

housing boom which everyone predicts. The laboratory is studying carefully and learning all it can about burning characteristics of anthracite. It is following the theory of finding out exactly what the fuel will do and then with the cooperation of equipment manufacturers, designing a piece of equipment to best utilize those characteristics. It is not trying to design equipment first and then adapt the fuel to the design. Success along these lines does not come over night, but a real start has already been made.

The laboratory performs another very definite public relations function through the help it is giving our government during this period of stress. Right now, much of the laboratory time is being freely donated to the testing of equipment for U. S. Army and Navy bases and for war production housing developments. Our staff of some 20 field representatives is carrying this work a step further in the field through the training of military personnel in better firing and maintenance methods. This service alone has saved the government thousands of dollars.

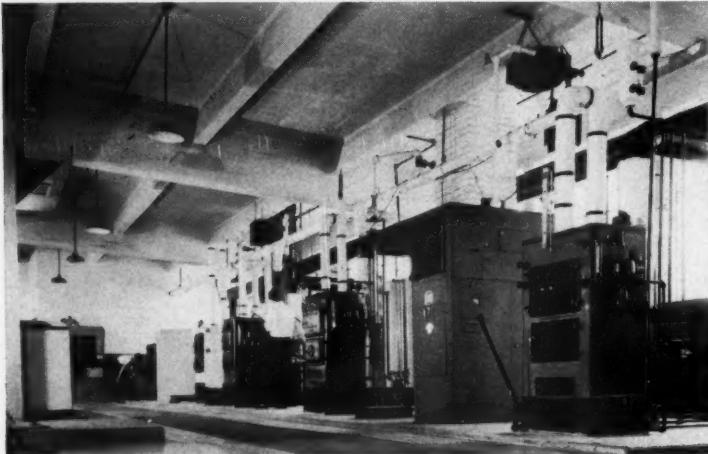
Our field representatives are assisting dealers in their problems of better serving the public. Not only have our men held schools for dealer personnel to teach the rudiments of proper firing, combustion and about heating systems and heating equipment, but today they are assisting dealers to overcome some of the limitations placed upon them by war conditions. For instance, it was anticipated some many months ago that Selective Service and war industry would draw heavily from the manpower ranks of the average dealer's service staff. This meant but one thing—that dealers would be able to render little or no personal service to consumers. This condition, of course, has come about and has even been considerably aggravated by the shortage of other fuels which in turn has

created customers who have never used anthracite before. To solve this, a survey was made which brought out the fact that nearly 80 percent of all consumer calls for service could be answered very easily because they had to do with simple operation or equipment adjustments. Consequently, we developed a Telephone Service Book. This book contains a series of questions and answers so arranged that a telephone operator, who previously had known nothing about heating with anthracite, could easily answer the complaint over the 'phone by proceeding with the book as a doctor would proceed in diagnosing any common ailment. Where a surgeon would be needed for a major operation, similarly, where a major correction job would be needed in anthracite heating, such service is referred to a heating and plumbing contractor. The use of these books has been demonstrated to over 4,000 dealer representatives.

We recognize the importance of telling our users how to get the most out of our fuel. We recognize, too, that the press and the radio are the means by which public opinion is molded but we found that the press and the radio were not particularly receptive—they were just not interested in coal, until we held a press reception atop the Hotel St. Regis in New York City. To this reception we invited about 200 representatives of the leading magazines, radio chains, newspapers and press syndicates. We showed them coal in actual operation. We demonstrated to them how it should be fired. We explained the proper maintenance of heating equipment and told them how the public could best benefit through the use of our fuel. Since that time, we have received very generous response from these editors and as a result, information about anthracite and its utilization has been flowing to consumers. Previously, editors had to seek for coal information. Today, we are attempting to make their job easier by furnishing them with facts of interest to their readers. This is another example of "making people want to do business with you."

#### **The Ash Problem**

We have not been satisfied to ignore our disadvantages either. For instance, the ash problem. Unquestionably our competition has sold the public on the idea that ash presents an unsurmountable chore. At Mellon Institute some years ago our Fellowship developed much valuable information on the use of anthracite ash as a soil conditioner. We have tied these facts up with Victory gardening and have taken a story to the public, which I believe, will considerably lessen their aversion to ash.



Laboratory of Anthracite Industries, Inc., at Primos, Pa.

So much for some of the basic facts of public relations as I visualize it in our industry and so much for some of the things that Anthracite Industries, Inc., are doing to influence people "to want to buy from us." Let us take the anthracite industry as a whole and look at a completely different problem that has been thrust upon the coal industry—I mean the problem of seeing to it that coal is equitably distributed during this wartime emergency. This example will permit us to better conceive another of the many different ways public relations can be applied to solve industry problems. Let us go over, step by step, in chronological order, the relations job done on this problem by the anthracite industry during the past 12 months.

It is recalled that during last spring and summer the government sponsored a very effective "Buy now and fill up your bin" campaign. Shortly after this campaign was launched, floods seriously affected production in many of the anthracite mines, some of whose output was impaired for many weeks. In such areas as Boston, Mass., the newspapers, through scare headlines, excited the public to a point where rush buying created temporary dislocations in dealers' supplies. During the summer it was impossible for most dealers throughout the anthracite-burning territory to build up the stocks they usually carried with the result that at the beginning of the burning season, the industry was faced with a situation of having a lot of coal in some consumer bins and no coal in others. Working with the Anthracite Coordinator's Office, the industry developed a program which was publicized in generous newspaper advertising space throughout the East with a copy theme of "Some Coal in Every Bin." This involved dealers' limiting their individual deliveries to two or three tons to those people who

had no coal stored in their cellars and withholding deliveries from those consumers who had enough coal for a 30- to 60-day period. This campaign broke the latter part of September and by the first of December the results accomplished in equalizing deliveries to all consumers were such that it was not necessary to run the last advertisement which was scheduled for early December.

While unquestionably the success of this program was, to a large part, due to the cooperation and coordination between the Anthracite Coordinator's Office, the producing companies and retail dealers, still without having carried this story to the public, I venture to say that the results that were accomplished would never have been. In other words, this was an example of public relations because "it was 90 percent doing, and 10 percent telling what we were doing."

Following through the 12-month cycle—during January, 1943, the industry was faced with unauthorized strikes by 17,000 of the 80,000 anthracite miners. Production was running neck and neck with demand—and

with publicity about fuel shortages getting prominent space in the press, the public was rapidly becoming jittery about their own supply. Again the industry took the true facts about the strike to the public through newspaper advertising. Newspaper editors, whose stories had been anything but reassuring, almost immediately reflected the true facts in their editorial comment. Surveys made among dealers during this period showed that no consumer panic buying took place. This again is an example of how public relations can affect public action.

Coming into the present period, the industry is again faced with a distributing problem. With even greater shortages of other fuels predicted for this coming season, we can expect even greater demands for our product. While I am not here in the role of a prophet, the anthracite industry expects to produce enough coal to satisfy this coming winter's requirements, but the spread between production and demand will not be great enough to permit any carelessness in distribution. The production for the next coal year has been estimated and plans have been worked out to see that this production is equitably distributed. Consumers will be barraged with information as to how they can cooperate with this plan to insure that no home will go without coal next winter. Producers, dealers and consumers cooperating with each other and with the government is the same way of solving whatever distribution problems may arise.

To sum up, public relations is "mostly what you do and partly what you say you do." Without coordinated thinking and action by all branches of the industry; without thought to cooperation with our government, and without proper consideration of what will most benefit the consumer, no public relations program is possible. Only by doing all of these things can solid fuel expect to return to and hold its proper place on "top of the heap."



The No. 7 colliery of Susquehanna Collieries Co., Nanticoke, Pa.



# Motor Drive For Eight-Mile Aerial Tramway

*Construction was among the last of its kind to be completed in a new Philippine gold mining area before Jap invasion*

By R. F. EMERSON

Industrial Engineering Department  
General Electric Company

Many difficulties were experienced in constructing the tramway through dense tropical growth

THE INSTALLATION described here covers the similar type of tramway used in many quarry operations, although in this case construction was difficult and gold ore was the important material conveyed before the Japs took over the Philippines. It is reasonable to assume this tramway is being used by the Japs to exploit this gold mine to the limit, while they have the opportunity. This tramway was erected on the island of Mindanao by the Interstate Equipment Corporation. It was owned by the Davao Gold Mines, Inc., and the installation furnishes a striking example of a job which was successfully completed despite mountainous terrain, vast stretches of dense underbrush, and the oppressive tropical heat.

The tramway is approximately 41,000 ft. long. The loading terminal at the mine is at an elevation of 1,550 ft. above sea level, while the discharge terminal at the mill is at an elevation of 525 ft. The line rises from the loading terminal to an elevation of 3,150 ft. in a horizontal distance of about 12,000 ft. From that point on the grade is largely downward to the discharge terminal.

Because of the long grade from tower 8 (the highest point in the line) down to the mill, it is possible for the descending buckets to overhaul those ascending from the mine to tower 8, as well as all the empty buckets returning from the mill to the mine.

In fact, when running under normal conditions, with all the buckets from mine to mill loaded, the driving motor regenerates power which assists in

the operation of other motors in the mill. The greatest load put on the motor is when it is started with all buckets empty, except those ascending loaded from the mine. This load gradually increases until all buckets from the mine to tower 8 are full and the buckets from this tower to the mill are empty.

When starting up with all buckets full, it requires a little over half a minute to get the tramway in motion. This is caused by the slack which must be taken up, the inertia of 150 buckets and 35 tons of ore, and the weight of the 82,000-ft. endless haulage cable. The tramway was constructed to convey 50 tons of gold ore per hour from the mine to the mill. However, since the line carries its

full capacity of ore, it regenerates ample power for the purpose. It is also used to transport men and supplies to and from the mine.

The terrain is typical jungle country, impenetrable for many miles. The tramway, therefore, provided the only means of efficient and reliable transportation to and from the property.

The ore buckets are of 8 cu. ft. capacity, and are attached to the haulage cable at spaced points by means of screw and friction grips mounted on each bucket pendant. The buckets are suspended from two-wheeled trolley carriers which travel on fixed track cables at a speed of 500 r.p.m. from terminal to terminal. At each terminal, a timing device is geared to one of the sheaves so as to ring a bell



Mill of the Davao gold mine on the island of Mindanao in the Philippines

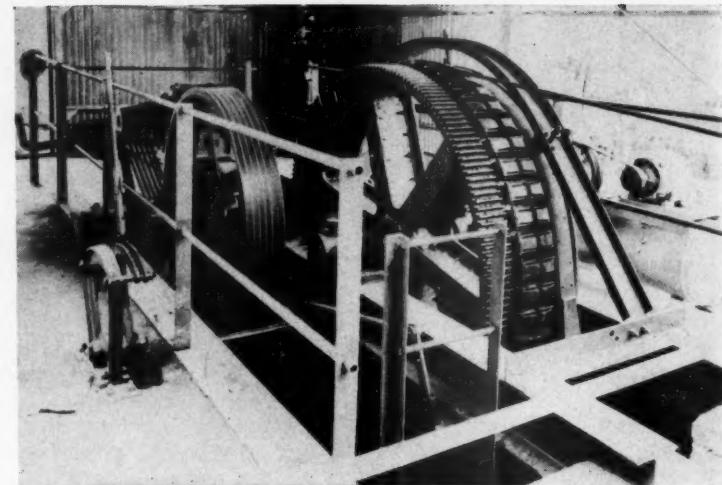
when the haulage cable has moved 150 ft. This signals the operator to attach another bucket.

At the terminals, the buckets are moved by hand to the loading gate or dumping position, after which they are again gripped to the haulage cable.

Between the terminals, the tramway track cables are supported by 24 steel towers. The track cables of each section are secured to concrete anchorages at the sides of the towers by turn buckles, which serve to adjust the tension of the cables. Steel rails take the place of the cables at the towers, providing tracks on which the buckets pass over the towers from one cable section to another. The drive for the tramway is located at the discharge terminal.

The motive equipment of the tramway consists of a 75-in. steel drum, on the face of which are mounted 54 grip units which engage the haulage cable. This drum is driven by spur gears and a V-belt from a two-speed, 60/30-h.p., 900/450-r.p.m., 440-volt, squirrel-cage motor. This motor, with resistance in series, with slow speed winding brings the pull side of the haulage cable up to half speed before the other side has started to move. Full magnetic push button control is used with this motor.

An electrically controlled, pneumatically operated friction band brake, mounted on the main drum, stops the tramway when desired, or automatically in case of failure of electric power. This latter provision is important, since with the loaded buckets travelling from the mine to the mill, the buckets descending from tower 8 to the discharge terminal would over-haul the system and cause it to over-speed.



Driving equipment for the tramway, showing breaks, grips, sheaves and motor

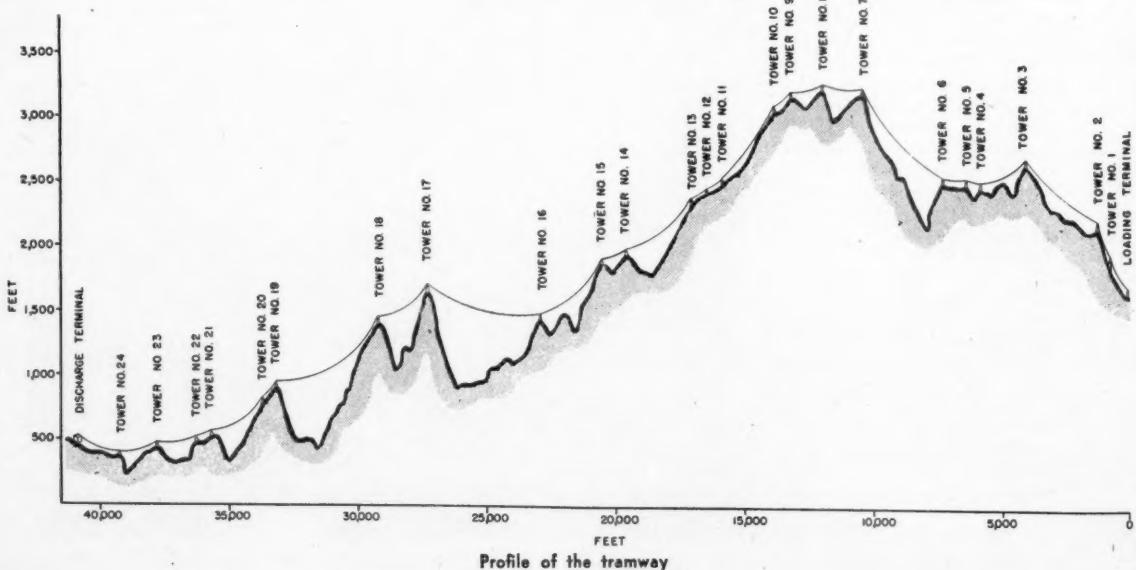
For normal operation, the driving motor acts as a brake and holds the tramway to its correct speed, but centrifugally operated switches are used to guard against possible overspeed or underspeed. Hence, if the haulage cable is slowed down or completely stopped for any reason, the centrifugal switch immediately interrupts the current to the motor and at the same time applies the main drive brake. In addition to the air brake, which can be operated automatically in an emergency, there is also an auxiliary hand brake.

Besides the 150 ore buckets, the tramway accommodates three passenger carriers. Two of these carriers were kept at the mine terminal, and one at the mill. Telephone lines connect the mill with the mine, so that the bucket attendant at the mine can be notified from the mill that the

tramway is ready to begin operations.

Considerable difficulty was experienced throughout this installation work, especially in the erection of the tramway towers, because of the jungle-like underbrush and the mountainous character of the country. One tramway tower was erected on a small knife-like ridge which projected from the steep mountainside. Otherwise, the tramway would have had to be strung over a 7,200-ft. span. As it is, the strain-stay cables supporting this tower were run almost straight down both sides of the little ridge for a considerable distance before suitable anchorages could be placed.

Natives of a little-known tribe of Filipino near-dwarfs supplied the labor on this project. Lured from the hills by the prospect of money, a rarity with them, they proved to be exceptionally good workers.





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## Construction Costs For Service Haulage Tracks

*A report approved and accepted by the Committee on  
Coal Mine Haulage Roads*

THE REPORT presented here has been prepared to indicate ways in which cost savings can be made in installing and removing entry and room tracks in panels operated by mobile mechanical loaders. There are many modifications of the room and pillar system and the committee has selected three basic mining plans for their study, as follows: Mine No. 1, room mining without pillar recovery; Mine No. 2, room mining with pillar recovery; Mine No. 3, block system with openend pillar recovery.

All of these plans have the common characteristic of concentrating the active workings into as few places as possible, so that the track may be moved and reused several times during the life of a panel.

The study covers standard material and also special material designed to reduce the work of the underground track crews, and the itemized cost tabulations for each mining system, presented in the following pages of this report, show three different types of construction. Class 1 uses stock rail entirely, with all labor of cutting and bending done by the track crews. Class 2 has the straight rails cut to predetermined lengths, the curved rails are pre-bent, and turnouts are manufactured knocked-down. Class 3 uses pre-cut and pre-bent rails, sectional fabricated turnouts and the angle bars and bolts are riveted or welded to the rail ends. Many of the labor cost figures are from actual records, while other labor figures are estimates, based on the combined judgment of the track equipment manufacturers and the mine operator. All material costs are calculated for 40-lb. rail in entries and rooms.

The following table, compiled from the detailed cost data sheets, shows the indicated net saving through the use of pre-fabricated material in each

### EXPLANATORY NOTES FOR MINE No. 1

Laying standard turnout on steel ties, \$7.86.

Laying and removing straight room track, loose joints, steel ties, \$8.19 per 100 ft. of track.

Laying and removing standard straight and curved entry track including: preparing of bottom, ballasting cutting and curving of rails for closure and stock rails for turnouts, \$3,460, or \$1.24 per ft. of track.

All other figures for Classes 2 and 3 are estimated from above, as no figures are available for this mine on all steel tie construction.

### EXPLANATORY NOTES FOR MINE No. 2

Laying standard turnout, 15 labor hours.

Removing standard turnout, 12 labor hours.

Laying turnout with steel ties and pre-curved rails, 12 labor hours.

Removing turnout with steel ties and pre-curved rails, 11 labor hours.

Laying sectional turnout, 5½ labor hours.

Removing sectional turnout, 5 labor hours.

Laying and removing standard straight track, loose joints, random length rails, steel ties, 13c per ft. (Case histories.)

Laying and removing standard curved track, loose joints, random length rails, hand curving, steel ties, 17c per ft. (Case histories.)

Laying and removing standard curved track, loose joints, pre-cut and pre-curved rails, steel ties, 13c per foot. (Case histories.)

Laying and removing standard straight or curved track with riveted joints, pre-cut and pre-curved rails, steel ties, 12c per ft.

Total straight track to be laid and removed in panel..... 10,514 ft.

Total curved track to be laid and removed in panel..... 2,944 ft.

Total turnouts to be laid and removed in panel..... 92

of the three systems, taking Class 1 in each case as 100 percent:

#### Mine No. 1

Class 1—labor and material cost	100 %
Class 2—labor and material cost	91.3%
Class 3—labor and material cost	84.7%

#### Mine No. 2

Class 1—labor and material cost	100 %
Class 2—labor and material cost	91.5%
Class 3—labor and material cost	86 %

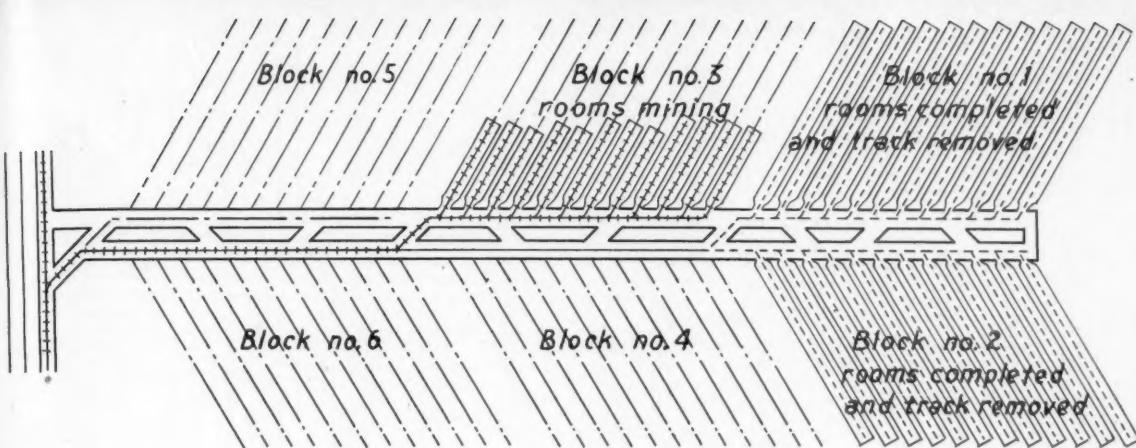
#### Mine No. 3

Class 1—labor and material cost	100 %
Class 2—labor and material cost	84.6%
Class 3—labor and material cost	82.9%

In order to eliminate the seam height factor, the final figure in the tabulations is given as "cost per acre" instead of "cost per ton," but the com-

mittee wishes particularly to emphasize that these costs, however expressed, should not be misunderstood as indicating the relative efficiencies of the track work in the three mines shown. There are too many variables involved to make such comparisons possible. The committee further wishes to state that the sketches were prepared to illustrate the general panel plans and are not exact copies of the actual mine maps. In all cases the material costs are illustrative of average prices at an average delivered point and are not to be construed as being specific published prices.

Approved May, 1943, by Committee on Coal Mine Haulage Roads.



Mine No. 1—Rooms without pillar recovery

**CLASS 1—TRACK WITH RANDOM STOCK MATERIAL**

Using steel room ties—wooden ties in entry and turnouts; 18' 0" rails in both entry and room track, standard joints, all cutting and curving of rail done by track laying crew.

Material Used in Panel	Unit Material Cost	Amount Material Used	Purchase Cost of Material	Times Used in Panel	Deprec. Rate	Material Chgd. to Panel	Labor to Install—Remove	Material and Labor Cost	
								Per Panel	Per Acre
Room Track—3,900 ft.....	\$44.00	49 G. T.	\$2,162.00	7.56	13%	\$282.00			
Steel ties No. 5.....	1.04	1,570	1,632.00	4.30	23%	375.00			
Joints and bolts.....	.82	433	402.00	3.83	26%	104.00			
Entry Track—261' curved									
562' straight.....	44.00	7.3 G. T.	332.00	7.56	13%	43.00			
Steel ties.....	1.04	115	120.00	4.30	23%	27.00			
Wood ties.....	.35	1,244	495.00	3	33 1/3%	145.00			
Joints and bolts.....	.82	57	47.00	3.83	26%	13.00			
Turnouts—No. 2 1/2 .....	69.00	26	1,638.00	12.65	8%	131.00			
Total.....			\$6,768.00			\$1,120.00		\$5,636.00	\$6,756.00
									\$375.33

**CLASS 2—TRACK WITH RAILS PRECUT AND PRECURVED**

Using steel ties in rooms and entry—steel switch ties with interlaced standard ties, standard turnouts knocked down with closure rail cut and curved. Stock rail precured and all straight rails cut to predetermined lengths.

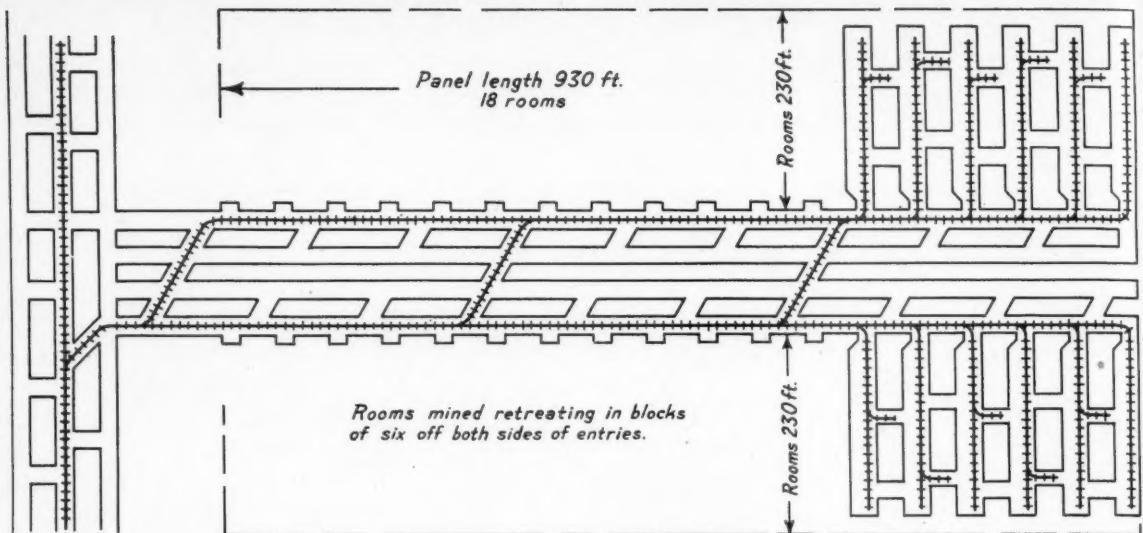
Material Used in Panel	Unit Material Cost	Amount Material Used	Purchase Cost of Material	Times Used in Panel	Deprec. Rate	Material Chgd. to Panel	Labor to Install—Remove	Material and Labor Cost	
								Per Panel	Per Acre
Room Track—3,900 ft.....	\$44.00	49 G. T.	\$2,162.00	7.56	13%	\$282.00			
Steel ties.....	1.04	1,570	1,632.00	4.30	23%	375.00			
Joints and bolts.....	.82	433	402.00	3.83	26%	104.00			
Entry Track—261' curved									
562' straight.....			987.00	7.56	13%	128.00			
Steel ties No. 5.....	1.04	1,859	1,426.00	4.30	23%	327.00			
Joints and bolts.....	.82	261	237.00	3.83	26%	62.00			
Extra bolts.....			16.00	1	100%	16.00			
Turnouts and steel ties.....	73.50	26	1,912.00	14	7%	134.00			
Total.....			\$8,774.00			\$1,428.00		\$4,739.00	\$6,167.00
									\$342.61

**CLASS 3—TRACK WITH FABRICATED MATERIAL**

Using steel ties in rooms and entry track, complete prefabricated turnouts of sectional type, all rails cut and precured and supplied with joints permanently attached to rails.

Material Used in Panel	Unit Material Cost	Amount Material Used	Purchase Cost of Material	Times Used in Panel	Deprec. Rate	Material Chgd. to Panel	Labor to Install—Remove	Material and Labor Cost	
								Per Panel	Per Acre
Room Track—3,900 ft.....									
Steel ties.....	\$1.04	1,570	\$3,150.00	7.56	13%	\$409.00			
Extra bolts.....			1,632.00	4.30	23%	375.00			
Entry Track—261' curved			8.00	1	100%	8.00			
562' straight.....									
Joints and bolts attached.....			1,432.00	7.56	13%	186.00			
Steel ties No. 5.....	1.04	1,244	1,306.00	10	10%	131.00			
Steel ties No. 5.....	1.04	115	120.00	4.30	23%	27.00			
Turnouts—Sectional.....	116.00	26	8,016.00	10	10%	302.00			
Total.....			\$10,664.00			\$1,438.00		\$4,286.00	\$5,724.00
									\$318.00

Submitted by J. R. Ulrich.



Mine No. 2—Rooms and pillar recovery

CLASS 1—TRACK WITH RANDOM STOCK MATERIAL

Using steel room ties; wood ties on the switches and turnouts; random length stock rails for straight and curved track and closure rails; standard purchased joints; all bonding, cutting and curving of rail done by tracklaying crew.

Material Used in Panel	Unit Material Cost	Amount Material Used	Purchase Cost of Material	Number Times Used	Deprec. Rate	Material Chgd. to Panel	Labor to Install—Remove	Material and Labor Cost Per Panel	Material and Labor Cost Per Acre
Straight track									
6,004 ft. @ 40 lb.	\$44.00	71.5 G. T.	\$3,146.00	20	5%	\$157.30			
Angle bars and bolts	.80	600 pr.	480.00	8	12%	60.00			
Steel ties No. 3—3°C.	.70	2,000	1,400.00	10	10%	140.00			
Curved Track									
1,594 ft. @ 40 lb.	44.00	19 G. T.	836.00	20	5%	41.80			
Angle bars and bolts	.80	160 pr.	128.00	8	12%	16.00			
Steel ties No. 3—3°C.	.70	530	371.00	10	10%	37.10			
Turnouts—No. 2 1/2	63.00	42	2,646.00	20	5%	132.00			
Total.			\$9,007.00			\$584.50	\$4,742.00	\$5,326.50	\$348.13

CLASS 2—TRACK WITH RAILS PRECUT AND PRECURVED

Using steel ties, steel switch ties with interlaced standard ties, turnouts purchased knocked down but with a closure rail cut and curved, stock rails precured and all straight rails cut to predetermined lengths.

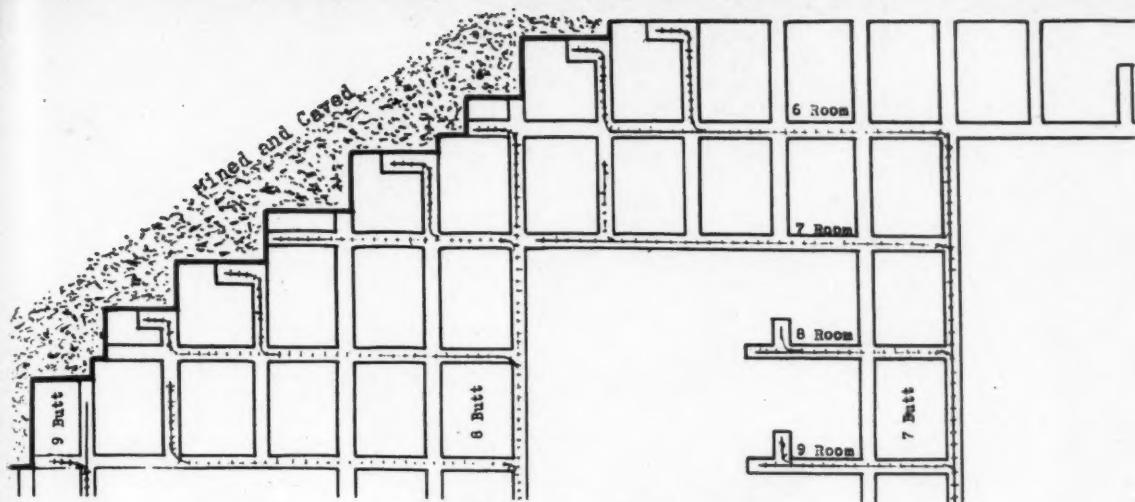
Material Used in Panel	Unit Material Cost	Amount Material Used	Purchase Cost of Material	Number Times Used	Deprec. Rate	Material Chgd. to Panel	Labor to Install—Remove	Material and Labor Cost Per Panel	Material and Labor Cost Per Acre
Straight track									
6,004 ft. @ 40 lb.	\$47.00	71.5 G. T.	\$3,360.50	20	5%	\$168.02			
Angle bars and bolts	.80	600 pr.	480.00	8	12%	60.00			
Steel ties No. 3—3°C.	.70	2,000	1,400.00	10	10%	140.00			
Curved Track									
1,594 ft. @ 40 lb.	\$47+10c	19 G. T.	1,052.40	20	5%	52.62			
Angle bars and bolts	.80	160 pr.	128.00	8	12%	16.00			
Steel ties No. 3—3°C.	.70	530	371.00	10	10%	37.10			
Turnouts—No. 2 1/2 K. D.	78.00	42	3,276.00	20	5%	163.80			
Total.			\$10,067.90			\$637.54	\$4,183.07	\$4,820.61	\$315.07

CLASS 3—TRACK WITH FABRICATED MATERIAL

Using steel ties, complete prefabricated turnouts of a sectional type, stock rails precured and straight rails cut to predetermined lengths—all rails supplied with joints permanently attached.

Material Used in Panel	Unit Material Cost	Amount Material Used	Purchase Cost of Material	Number Times Used	Deprec. Rate	Material Chgd. to Panel	Labor to Install—Remove	Material and Labor Cost Per Panel	Material and Labor Cost Per Acre
Straight track									
6,004 ft. @ 40 lb.	\$47.00	71.5 G. T.	\$3,360.50	14	7%	\$240.00			
Angle bars riveted	1.30	600 pr.	780.00	14	7%	55.71			
Steel ties No. 3—3°C.	.70	2,000	1,400.00	10	10%	140.00			
Curved Track									
1,594 ft. @ 40 lb.	\$47+10c	19 G. T.	1,052.40	14	7%	75.17			
Angle bars riveted	1.30	160 pr.	208.00	14	7%	14.85			
Steel ties No. 3—3°C.	.70	530	371.00	10	10%	37.10			
Turnouts—sectional	100.00	42	4,200.00	14	7%	294.00			
Total.			\$11,871.90			\$856.83	\$2,654.62	\$3,511.45	\$229.50

Submitted by J. B. Haskell.



Mine No. 3—Block system with pillar recovery

**CLASS 1—TRACK WITH RANDOM STOCK MATERIAL**

Using steel ties in rooms and entries, wood ties on switches and turnouts, random length stock rails used for straight track, curved track and closure rails; standard purchased joints with all necessary bonding, cutting and curving of rails done by tracklaying crew.

Material Used in Panel	Unit Material Cost	Amount Material Used	Purchase Cost of Material	Times Used in Panel	Deprec. Rate	Material Chgd. to Panel	Labor to Install—Remove		Material and Labor Cost	
							Per Panel	Per Acre		
Straight Track—4,620 ft. in entries and rooms.....	\$44.00	55 G. T.	\$2,420.00	4,280' @ 1 340' @ 30 315' @ 30	12.5%	\$302.50	\$1,882.40			
Curved Track—630 ft. in entries and rooms.....	44.00	7.5 G. T.	380.00	315' @ 1 315' @ 30	16.7%	55.00	1,346.63			
Joints and bolts.....	.80	518	414.40	7% @ 30 93% @ 1	25%	108.60				
Wood ties.....	.30	360	108.00	7% @ 30	50%	54.00				
Steel ties.....	.70	3,100	2,170.00	93% @ 1	25%	542.50				19.3 acres
Turnouts.....	63.00	30	1,890.00	3	16.7%	315.00	1,508.00			
Total.....			\$7,332.40			\$1,372.60	\$4,732.08	\$6,104.63		\$316.30

**CLASS 2—TRACK WITH RAILS PRECUT AND PRECURVED**

Using steel ties, steel switch ties with standard steel ties interlaced; standard purchased turnouts knocked down, but with closure rails cut and curved; stock rails precut and all straight rails cut to predetermined lengths.

Material Used in Panel	Unit Material Cost	Amount Material Used	Purchase Cost of Material	Times Used in Panel	Deprec. Rate	Material Chgd. to Panel	Labor to Install—Remove		Material and Labor Cost	
							Per Panel	Per Acre		
Straight Track—4,620 ft. in entries and rooms.....	\$47.00	55 G. T.	\$2,585.00	4,280' @ 1 340' @ 30 315' @ 30	10%	\$258.00	\$1,737.60			
Curved Track—630 ft. in entries and rooms.....	7½ G. T.	478.00		315' @ 30	10%	47.80	1,171.80			
Joints and bolts.....	.80	518	414.40	7% @ 30 93% @ 1	25%	108.60				
Steel ties.....	.70	3,460	2,422.00	7% @ 30 93% @ 1	25%	605.50				19.3 acres
Turnouts—knocked down.....	71.30	30	2,140.00	3	16.7%	356.67	882.00			
Total.....			\$8,039.40			\$1,372.07	\$3,791.40	\$5,163.47		\$267.52

**CLASS 3—TRACK WITH FABRICATED MATERIAL**

Using steel ties, complete prefabricated turnouts of a sectional type, all rails cut and precurved and supplied with joints permanently attached to the rails.

Material Used in Panel	Unit Material Cost	Amount Material Used	Purchase Cost of Material	Times Used in Panel	Deprec. Rate	Material Chgd. to Panel	Labor to Install—Remove		Material and Labor Cost	
							Per Panel	Per Acre		
Straight Track—4,620 ft. in entries and rooms.....	55 G. T.	\$3,179.00	4,280' @ 1 340' @ 30 315' @ 30	10%	\$317.90	\$1,737.60				
Curved Track—630 ft. in entries and rooms.....	7½ G. T.	557.00	315' @ 1 315' @ 30	10%	55.70	1,171.80				
Joints—attached to rail.....	518	With rail								
Steel ties—spaced 24" centers.....	.70	3,070	2,150.00	7% @ 30 93% @ 1	25%	537.50				19.3 acres
Turnouts—sectional.....	116.00	30	3,480.00	3	16.7%	580.00	661.50			
Total.....			\$9,366.00			\$1,491.10	\$3,570.90	\$5,062.00		\$262.28

Submitted by J. H. Siebert.



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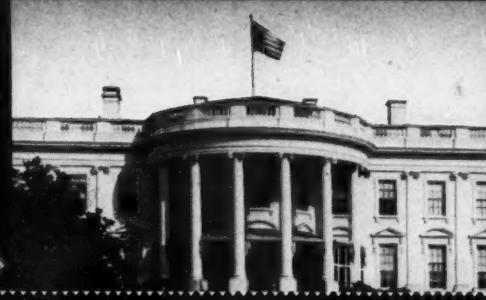
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# Wheels of Government

*As Viewed by A. W. Dickinson of the American Mining Congress*

**G**EUNIENEY WEARIED by the baffling and rather unfruitful struggles of recent months, the House and Senate are looking forward with longing to a summer adjournment or recess possibly from around July 4 to Labor Day or, as is more likely, from around July 15 to September 15. With the withholding tax bill and the controversy over the President's Foreign Trade Agreements Authority extension virtually out of the way, only the departmental supply bills for the fiscal year 1944 remain as "must" items prior to a legislative vacation. These appropriations must be cared for by June 30 to provide for the uninterrupted functioning of administrative departments and independent and war agencies.

## Ruml Trouble

Revived in late April after its ignominious recommitment to the Ways and Means Committee, the Doughton withholding tax bill was brought out on the House floor calling for taxing 1942 incomes at 1941 levels of rates and exemptions, and giving taxpayers three years to pay off this obligation while at the same time paying taxes for the current year at 1942 or higher rates. After defeating the Rumml-Carlson plan to abate a full year's tax by the narrow margin of 206-202, the Forand-Robertson bill was passed and sent to the Senate. This measure would have abated the 6 percent normal and 13 percent first bracket surtax on 1942 incomes, and also carried the 20 percent withholding tax.

The Senate Finance Committee reported and the Senate passed a Ruml-type 100 percent abatement of the tax on 1942 or 1943 income, whichever was lower, with the 20 percent withholding tax simplified by providing a single set of exemptions, i.e., \$624 for a single person, \$1,248 for a married person and \$312 additional for each dependent.

Mustering Administration forces,



## Washington Highlights

**CONGRESS:** Wants a vacation.

**RUML TROUBLE:** Approaches the end.

**JULY 1:** 20 percent withholding tax begins.

**TRADE AGREEMENTS ACT:** Administration pushing hard.

**GUFFEY ACT:** Law extended to August 24.

**SILVER:** Made available to industry at 71.11c.

**ASSESSMENT WORK:** Suspended for the duration.

**MINE RELIEF BILL:** Hearings set for June 10 and 11.

**STOCKPILING:** Bill will soon be introduced by Senator Scrugham.

**ANTI-STRIKE MEASURE:** Hush, hush by Administration.

**COAL MINERS' WAGES:** Settlement hoped for.



the House rejected the Senate bill and conferees wrestled with the problem over the weekend, finally reporting on May 25 a compromise worked out by Senator George which abates 75 percent of income tax liability on 1942 or 1943 taxes, whichever was lower, with small taxpayers receiving 100 percent abatement. Unabated tax liability will be payable over two years, one-half on March 15, 1944, and the other half March 15, 1945. Installments paid March 15 and due June 15 in the current year constitute a credit in settlement of taxes on 1943 income. The 20 percent withholding tax starts July 1.

## Trade Agreement Powers

Now under debate in the Senate, the bill extending the President's authority to make foreign trade agreements was amended in the House to limit the extension to two years. An amendment added by the Senate Finance Committee provides that six months after the President determines the war to have ceased, Congress by joint resolution or the President by proclamation may terminate trade agreements made under this Act. This amendment particularly is being bitterly opposed by the State Department.

The position of the American Mining Congress on the bill was presented to the Finance Committee by Secretary Julian D. Conover, who urged the following amendments to minimize injuries to domestic producers and workmen: (1) That Congress review and pass upon trade agreements before they become effective; (2) that concessions on any commodity be made only to that country which constitutes the principal source of imports; and (3) that definite provisions be adopted in the law making mandatory the application of the "escape clauses," and providing for adequate review and correction of injuries to domestic producers. Full text of this statement begins on page 31.

Strong Administration pressure is being exerted for quick enactment of the trade agreements authority, which otherwise would expire on June 12.

## Guffey Act Extension

Following earlier enactment of a 30-day extension in the life of the Bituminous Coal Act, a further bill has just been passed extending the law to August 24 to permit hearings on the original Doughton bill, which would carry the Act over until two years after the war. The 90-day extension was made at the request of

Solid Fuels Administrator for War Harold Ickes.

### Silver for Industry

The Green Silver Bill, S. 35, reported to the Senate on May 11, was the subject of two days of hearings before a Banking and Currency Subcommittee in late April at which witnesses included Thomas J. Lynch, assistant general counsel of the Treasury; G. H. Niemeyer, president of Handy and Harmon of New York; Howard I. Young, Director of the Mineral Resources Coordinating Division and Richard J. Lund, Director of the Miscellaneous Minerals Division of WPB; Captain McDowell, of the Navy Department; Senator Pat McCarran, of Nevada; and F. S. Brownell, chairman of the American Smelting and Refining Company. The bill as reported reads:

"That the President is authorized, through the Secretary of the Treasury, upon the recommendation of the Chairman of the War Production Board, to sell or lease for domestic purposes, for a period of not longer than six months after the cessation of hostilities in the present war, as proclaimed by the President, upon such terms as the Secretary of the Treasury shall deem advisable, to any person, partnership, association, or corporation, or any department of the Government, for use in furtherance of the war effort, including but not limited to the making of munitions of war and the supplying of civilian needs contributing to the war effort, and the converting of existing plants to those purposes, any silver held or owned by the United States: Provided, That no silver shall be sold under this Act at less than 71.11 cents per fine troy ounce: Provided further, That at all times the ownership and possession or control within the United States of an amount of silver of a monetary value equal to the face amount of all outstanding silver certificates heretofore or hereafter issued by the Secretary of the Treasury shall be maintained by the Treasury.

"Sec. 2. This Act shall expire on December 31, 1944."

Under the terms of the bill manufacturers of commercial products may procure silver at not less than 71.11 cents and the so-called "bus bar" silver may be used as a monetary guarantee for outstanding silver certificates. Interesting in this connection is the testimony of Lend-Lease Administrator E. R. Stettinius, Jr., before the Senate Special Silver Committee, in which he discussed Great Britain's acute shortage of silver for industrial and coinage purposes. He stated that in addition to its supply from Canada, Great Britain is asking for 3 1/2 million ounces from this country by June 1 and for 12 million ounces during the remainder of the present year. Stettinius explained that the need exists because of military and industrial activity in the Middle East, India, and elsewhere.

### Suspension of Assessment Work

The known shortage of labor in mining districts had a definite bearing on the passage of the bill providing for suspension of assessment work on mining claims, offered by Representative John R. Murdock (Dem., Ariz.). By its terms assess-

ment work is suspended on lode and placer claims for the duration of the war, without limitation as to the number of claims held by any one individual or corporation.

### Stockpiling

A bill soon to be introduced by Senator James G. Scrugham, of Nevada, chairman of the Mining and Minerals Subcommittee of the Senate Committee on Small Business, will provide for stockpiling by the Government of strategic materials. Viewing the possibility of a long war with resultant needs for sufficient stockpiles of metals and minerals, the bill also makes provision for continuing the program following the war to protect against a repetition of the demoralization of domestic markets by sudden release of supplies in this country.

### Anti-Strike Bill

Pressure for enactment of the Smith-Connally anti-strike bill which, after passing the Senate, is now on the House calendar in amended form, has materially decreased as the result of a letter to Speaker Sam Rayburn from seven Government agencies stating that the bill would promote labor unrest, interfere with war production, and impair existing machinery for the settlement of disputes. The letter was signed by top officials of WPB, the Navy, War, and Labor Departments, Maritime Commission, and National Labor Relations Board, and by the four public members of WLB.

In its present form the Smith-Connally bill would empower the Government to delay strikes in all war industries for 90 days, would prohibit strikes in Government-operated plants and would empower the WLB to compel attendance of union officials at hearings. The bill outlaws the use of violence and intimidation, jurisdictional and sympathy strikes, and secondary boycott; also provided for are registration of unions and detailed financial report of union operations. One provision requires that in no event shall the War Labor Board have power to require as a condition of employment that any individual become or remain a member of a labor organization.

The issue of unionization of supervisory employees was settled in a decree by a recent NLRB decision in the case of the Maryland Drydock Company and Industrial Union of Marine and Shipbuilding Workers (CIO) when the Board rejected the CIO's contention that supervisory employees be merged with the existing contractual body of production employees or be permitted to establish separate units. The Board stated that the interest of foremen lies predominantly with the management group, and charged that the establishment of bargaining units composed of

supervisors exercising managerial authority would impede the processes of collective bargaining and disrupt managerial and production techniques.

### Coal Wage Controversy

Immediately following certification of the coal wage dispute to the War Labor Board by Secretary Perkins, the President by Executive order on April 23 appointed Interior Secretary Ickes as Solid Fuels Administrator for War. Following the failure of UMWA representatives to appear before the War Labor Board, Administrator Ickes placed the bituminous and anthracite mines under Federal control. Workmen at a number of mines stayed away from the properties for three and four days before May 1 and on May 1 and 2 practically all mines were idle. In a radio address on Sunday night, May 2, the President appealed to the miners to return to work, but just previous to this address UMWA officials announced an extension of work through May 18. At Administrator Ickes' request this was later extended to May 31.

Meanwhile the War Labor Board, through its three-man panel, continued to receive testimony from representatives of the northern and southern operators, in the absence of any representations from the UMWA. Board members severely criticized President John L. Lewis of the mine workers, and the country was startled by the announcement of AFL President William Green that the UMWA had formally applied for restoration of membership in the AFL.

On May 21 the Labor Board's panel submitted a 44-page report without recommendations, although inferentially favoring the portal-to-portal demand, overtime pay for Saturday, and a guaranteed six-day week, increase in vacation pay and absorption of certain charges. The full Board rendered its decision on May 25 granting an increase in vacation pay as well as the elimination of blacksmithing, lamp rental, and safety equipment charges. While denying the \$2 a day wage increase, the Board recommended consideration of the portal-to-portal pay and a guaranteed sixth working day in each week to be made the subject of collective bargaining procedure between the operators and miners, who were instructed to report back within 15 days. Collective bargaining was immediately resumed based upon the findings of the Board, and at present an optimistic attitude is evidenced by both operators and miners. The mine workers are reported to be contending for a traveling time reimbursement which would be in excess of the \$2 per day increase originally demanded but this is generally regarded as a not unusual procedure in the course of collective bargaining.

# PERSONALS...

**W. P. Phelps**, for many years in charge of Tom Reed gold mines in Oatman, Ariz., has been appointed general superintendent at Getchell Mines, Inc., producers of tungsten, arsenic and gold in Humboldt county, Nev. He succeeds **Fred Wise**, now in the armed service of the United States.

**John G. Weysser**, formerly of the Lehigh Navigation Coal Co., Lansford, is currently acting as deputy chief of the coal section of the Mining Equipment Division in Washington.

**Thomas Beaney** was appointed superintendent of the No. 6 and Butler collieries of the Volpe Coal Company, Pittston, Pa. These properties were acquired recently by the Jermyn-Green interests.

**Richard Roberts**, mine foreman for the Glen Alden Coal Company at Buttonwood colliery, Wilkes Barre, Pa., has been transferred to No. 20 Mine at Ashley. A testimonial dinner was given Mr. Roberts who has worked for the company for a period of 25 years.

**William Embry Wrather**, Dallas, Tex., petroleum geologist, has been named by President Roosevelt to be the new director of the U. S. Geological Survey, succeeding W. C. Mendenhall who retired recently. Mr. Wrather,



ther, for the past year, has been serving as Associate Chief of the Metals and Minerals Section of the Board of Economic Warfare and was recommended for his new assignment by the National Academy of Science. He has been consultant in the petroleum industry for 25 years and has enjoyed broad geological and business experience.

**James Douglas** has been appointed director of the Zinc Division succeeding **George C. Heikes**, who recently joined the staff of the Olin Corpora-



tion, Tacoma, Wash. The new director entered the Government service in May, 1941, with the Copper-Zinc Branch of the Office of Production Management, and a year later joined the WPB Mining Equipment Division, which he is leaving to take his new post. Mr. Douglas is a native of Los Angeles, Calif., and has been previously engaged in mining operations in South Africa, Canada, South America and properties in the western United States.

**Dr. Thomas E. Larkin** of the Anthracite Conciliation Board, Hazelton, has been named by the National War Labor Board as a public member on the advisory board to the N.W.L.B. in Region III.

**Francis W. Christiansen** has succeeded James Douglas as Chief of the Metals Section. Mr. Christiansen has been serving as Assistant Deputy Director of Mining Equipment Division since September, 1942, and previously was an industrial specialist in the Metals Section.

At a recent meeting of the Board of Directors of the Bucyrus-Erie Company, N. R. Knox was elected president and W. W. Coleman, who has been company president for 32 years, was reelected chairman of the board. George A. Morison, former vice president, was elected vice chairman of the board. W. L. Little was elected vice president, and will be in charge of the company's plants at Erie, Pa., and Evansville, Ind.

In order to give maximum cooperation in the war effort, and at the same time expand its services to the coal mining industry, the Portable Lamp and Equipment Company, Pittsburgh, Pa., announces the following changes in executive personnel. **William K. Wilbur**, vice president and formerly district manager at Bluefield, W. Va., has been transferred to Washington, D. C., where he will handle all portable war contracts with the government. Mr. Wilbur is succeeded at Bluefield by **Richard G. Repaire**, who becomes district manager for West Virginia, Tennessee and Kentucky. **F. R. Marlier** has been named president of the company, succeeding **George C. Nelms** who becomes chairman of the board of directors. New vice presidents include **Harold A. Hill**, in charge of production, and **Henry E. Schweinsberg**, in charge of mining sales and servicing of lamp contracts. Mr. Schweinsberg was formerly mining engineer for the Valley Camp Coal Company.

**C. H. Carlton**, formerly mine superintendent of the Ajax and Elkton properties in Cripple Creek, Colo., recently took over a new position in the laboratory of the Golden Cycle mill, a portion of which has been converted to zinc production. Earl Bebee has replaced him as mine superintendent of the Ajax-Elkton mines.

**M. W. Heinritz**, of Trenton, N. J., has been named vice president in charge of the Storage Battery Division of Philco Corporation, it was announced recently by **Larry E. Gubb**, chairman of the board of directors.

Mr. Heinritz, who joined Philco in



1922, was born in Clinton, Mass. During the last war he served in the Signal Corps and then returned to the Worcester Polytechnic Institute from which he was graduated in 1920. Mr. Heinritz's first assignment with Philco was the sale of storage batteries to the mining industry in northern West Virginia. In January, 1938, he was named general manager of the Philco Storage Battery Division with offices in Philadelphia.

Stanley M. Moos, eastern manager of the Denver Equipment Company for the past two years, has been appointed general manager of Denver



Equipment Company, S. A., with offices in Edificio Jalisco, Calle Ejido No. 7, Mexico, D. F. Mr. Moos is a mining and metallurgical engineer, having graduated from the College of Mines, University of Arizona. He has had practical experience in the mines and mills of various mining companies in the Western United States and wide field experience throughout the United States and Latin America.

Graham Granger, after a two years' leave of absence, has re-entered the employ of the Koppers Coal Division, Eastern Gas and Fuel Associates, as assistant general manager of sales, according to an announcement by Walter Rothenhoefer, general manager of sales.

William Cuthbert recently resigned his position with Pittsburgh Coal Company to become project engineer for the Valley Camp Coal Company. Mr. Cuthbert is stationed at Elm Grove, W. Va.

Hugh P. Downey has joined the staff of the Consolidated Coppermines Corp., Kimberly, Nev., as a geologist.

A. C. Harding has been appointed superintendent of the Clay Spur bentonite plant near Osage, Wyo., by the Baroid Sales Division, National Lead Co. He was formerly engineer at their El Portal, Calif., barite mine.

Ernest W. Stepp, manager of the standards department, Pond Creek Pocahontas Co., Bartley, W. Va., has been appointed superintendent of No. 4 mine, Raysal. He succeeds Dennis K. Scott, who resigned to accept a position in La Paz, Bolivia.

Adam MacKenzie, vice president in charge of manufacturing, Carboley Company, Inc., was elected chairman of the Detroit Section, American Institute of Mining and Metallurgical Engineers at the April 19 meeting of this section.

Alex Duncan, mine manager for several years at No. 4 mine of the Superior Coal Co., Gillespie, Ill., has been promoted to assistant superintendent.

E. G. Hollman, research metallurgist with the Eagle-Picher Lead Co., has been transferred to Cincinnati from Joplin, Mo.

James E. Hayes, formerly president of the New Jersey Zinc Co., has been made chairman of the board, succeeding the late Edgar Palmer. Henry Hardenbergh, formerly vice president of the company is now president.

Henry Krumb recently resigned as a member of the board of directors of the Magma Copper Co., Superior, Ariz. Harry T. Hamilton has been appointed to the board.

Roy J. Bentley, formerly associated with the Homestake Mining Co., is now district mining engineer with Metals Reserve Co., with offices at Rio de Janeiro.

Weston G. Frome was appointed assistant general manager of the Explosives Department of Atlas Powder Company, Wilmington, Del., effective May 1 according to a recent announce-



ment by Leland Lyon, president. Mr. Frome was general manager of Atlas Powder Company's Giant Division at San Francisco, Calif. He will now make his headquarters in the company's general office in Wilmington, Del.

## — Obituaries —

Mining men throughout the west were greatly shocked by the sudden death of Congressman Harry L. Englebright, 59, of California, Republican



whip of the House of Representatives. Mr. Englebright, a native of Nevada City, Calif., had served in the House since 1926 and was a staunch friend of the mining industry.

Colonel Percy E. Barbour, 67, New York consulting mining engineer and authority on the economics of copper, gold and silver, died May 4, in Lima, Peru, after a short illness. Appointed a senior technical analyst by the State Department last October, Colonel Barbour had been stationed for five months at Lima on a government mission.

Colonel Barbour was secretary and treasurer since 1931 of the Mining and Metallurgical Society of America, he was founder and editor from 1919 to 1925 of Mining and Metallurgy and author of "Secondary Copper" and various technical articles and papers. He was engineer and manager of sev-

eral copper mining companies in the western states. He was a member of the editorial staff and managing editor of the *Engineering and Mining Journal*, New York, 1915-17; assistant secretary of the American Institute of Mining and Metallurgical Engineers, New York, 1919-25; assistant to the manager of the exploration department, St. Joseph Lead Company, 1925-27, and consulting mining engineer since 1927.

John K. Shaw, Sr., 67, died of a heart ailment at his home in Green Spring Valley, after an illness of five months. Mr. Shaw was owner of Shaw Bros. Coal Mining Co., and he held an executive post in several Baltimore corporations.

John T. Burrows, 59, of New York, died in Rapid City, N. D., on April 27. Mr. Burrows was formerly president of Union Potash & Chemical Corp. and vice president of International Minerals & Chemical Corp. He was also president of Phosphate Recovery Corp. until Minerals Separation North American Corp. acquired complete ownership, when he became vice president of the last-named organization.

F. D. Willoughby, 70, president of Midnight Mining Co., died Sunday, May 23, on the way to Grand Junction for medical attention. Mr. Willoughby was widely known in Colorado and throughout the West and had frequently spoken on mining problems at meetings of the American Mining Congress and other organizations.

# News and Views

## Eastern



## States

### PENNSYLVANIA

»»» A meeting of beehive coke oven operators of Fayette and Westmoreland Counties, Pa., was held on April 16 in Uniontown, Pa. The U. S. Bureau of Mines sponsored the meeting for the purpose of promoting greater production of high quality coke for the nation's blast furnaces. Speakers included Harlen M. Chapman, assistant deputy coordinator of solid fuels for war; Samuel Weiss, chief of the fuels section, raw materials branch, WPB; L. D. Schmidt, Pittsburgh, Pa., engineer in charge of the Bureau of Mines' coke production survey, and J. C. Barrett, a blast furnace operator.

»»» Many engineers and coal mining executives attended the spring meeting of the American Institute of Mining Engineers, held in Pottsville during May. A paper was read by Oscar Shimer of the Hudson Coal Company on "Stripping in the Pennsylvania Anthracite Region," and D. L. Freiler of the Philadelphia and Reading Coal & Iron Company described the method used to extinguish a mine fire in a seam of coal 30 feet thick on a dip of 50 degrees. Lieutenant Colonel Ash, chairman of the local section of the institute was in charge of the meeting.

»»» Judge Kirkpatrick of the United States District Court has agreed to the third extension of time to settle the affairs of the Philadelphia and Reading Coal and Iron Company of Pottsville, which is now being reorganized under the Chandler bankruptcy law. The proposed plan contemplates the reduction of the capital structure from \$62,000,000 to \$12,000,000. Since the company is now oper-

ating at a profit, the Judge was of the opinion that no harm would be done any security holder by the time extension.

»»» A new stripping project has been started on the Hudson Coal Company's lands near Middleport, and the coal thus recovered will be prepared in breakers located in that area.

»»» Registered Professional Engineers of Northeastern Pennsylvania held their monthly meeting in Hazelton on May 15. H. H. Otto, mining engineer of the Hudson Coal Company presided. Interest in this activity is commendable, because of its deterrent effect on moves to unionize engineers.

»»» The annual report of the Erie Railroad Company for 1942 showed an increase of 9.06 percent over the previous year in the tonnage

of anthracite coal hauled, and this amounted to 13.92 percent of the road's total freight.

»»» During March the Philadelphia and Reading Coal & Iron Company, Pottsville, produced 680,000 tons of anthracite, the highest monthly output in many years.

»»» In a case involving about 1,000 employees of the Edison Anthracite Coal Company, at Nesquehoning, the State Superior Court has denied the appeal of one of the miners for compensation during a strike caused by increased union dues imposed by the union, and deducted from earnings by the Edison Anthracite Coal Company. Presiding Judge William H. Koller said this in connection with his decision: "We are of the opinion that the employee's suspension of work was voluntary within the meaning of the act. The fundamental idea of the act is to provide a reserve fund to be used for the benefit of persons unemployed through no fault of their own."

### WEST VIRGINIA

»»» Coal producers in West Virginia had to take another rap on the knuckles when the Federal Wage and

### Coal Mine War Conference—July 19-20

In view of the general preoccupation by coal mine executives and operating men in wage negotiations with the miners, and with virtually all coal mines under the jurisdiction of the Government, the American Mining Congress postponed its annual meeting of the coal industry from May 17-18 to July 19-20, following consultation with industry leaders. It is hoped that the distractions which have existed in the industry for some time will have disappeared by July, thereby permitting a larger attendance and closer attention to the business of the War Conference.

The program will be essentially the same, except for later developments which may require amplification or alteration of some of the addresses. The new dates are the earliest at which needed hotel facilities are available, and Cincinnati Hotels have transferred room reservations made for the May Conference to the corresponding days in July. It is suggested that all those expecting to attend should write immediately advising arrival dates so that definite confirmation can be made.

Hour Division denied the necessary permission for operators to grant wage increases to salaried employes who were within the scope of the division's control.

When the permissive agreement was made with the Mine Workers in February upon the insistence of Secretary Ickes that the mines operate six days with overtime for the sixth day, the wages of mine workers was "upped" so pronouncedly that the long established relationships between union workers and company employes, not covered by a group wage contract, were considerably disrupted. The immediate concern of the operators was to restore the former parity by increasing wages to such company employes. After numerous conferences with the state representative of the Wage and Hour Division operators were advised that a blanket application could be filed by an association for its members interested in making such advances.

The application authority was generally considered as the equivalent to the granting of the request. This blanket application by the associations did not bar individual companies from making a similar application and many did so, but the whole thing went into the discard when the Wage and Hour Division denied the right of the operators to keep their wage records on an even keel through a flat increase to those whose wages were not automatically improved by the sixth day at time and one-half or rate and one-half. It was a rebuke to a sincere desire that all employes receive equal advantages.

»»» Southern West Virginia mines are again operating on the regular six-day week schedule that began February 13. Only a few strikes were recorded in this section during the last week of April and those were confined to one or two days and of minor importance to production.

»»» The Thirty-first Annual Short Course in Coal Mining will be given at School of Mines, West Virginia University, Morgantown, W. Va., and at the Beckley Junior High School, Beckley, W. Va., and Logan High School, Logan, W. Va. Classes will start June 7 and continue to July 17. The course will involve six weeks of study devoted to the technical phases and principles of modern coal mining.

The subjects are closely applicable to the everyday problems of modern coal mining, and instruction has been planned to be of maximum interest and value to the practical mining man, and special provisions have been made to permit those with limited educational background to profit from the work given.

All classes are conducted by members of the staff of the Mining Extension Department. In addition to the

classroom and lecture work, questions for home study will be assigned daily. All homework will be written and will be examined, corrected and returned to the students by the instructors. The subjects include mining arithmetic, mine ventilation, mine gases, mine fires and explosions, drainage and pumping, timbering, methods of mining, safety lamps, electricity, haulage, explosives, foremanship and West Virginia mining law.

### NORTH CAROLINA

»»» A recent report from the U. S. Bureau of Mines describing the asbestos production in 1942 states that W. T. Hippay and the Powhatan Mining Company continued to operate their mines in the Micaville area of Yancey County, North Carolina. The Industrial Minerals Corporation began production from a new property near Newdale, early in 1942 and marketed substantial quantities of amphibole asbestos before the end of the year. According to reports, the asbestos-bearing rock mass is at least 200 ft. wide and 400 ft. long. It gives promise of production on a larger scale than is possible at most amphibole deposits.

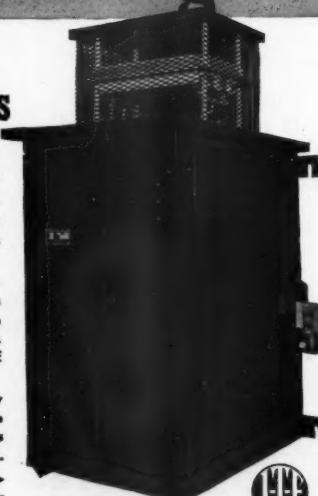
### GEORGIA

»»» During 1942 the only activity reported in the production of asbestos in this state was that of the Powhatan Mining Company which continued operation of its amphibole asbestos mine near Dillard, Rabun County.

»»» A guide to prospecting for additional reserves of bauxite (aluminum ore) in the Springvale mining district, Randolph County, southwestern Georgia, was released early in April by the Geological Survey, United States Department of the Interior. About 16,000 tons of bauxite was mined in this district between 1916 and 1920, but no mining has been done since. Preliminary work indicates that many additional small to medium-sized ore bodies can be found in the Eocene Nanafalia formation near Springvale. A map that shows those areas in which drilling is most likely to reveal bauxite has been prepared and is accompanied by a brief descriptive text.

»»» A map intended to give help in prospecting for bauxite (aluminum ore) in the Andersonville mining

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district in west-central Georgia was recently released. The map was prepared by geologists of the Geological Survey, United States Department of the Interior. It covers an area of approximately 110 square miles in Macon, Sumter, and Schley Counties, Ga., and shows the location of existing bauxite mines and prospects and the outcrops of the bauxite-bearing formation.

The Andersonville district has produced about 400,000 tons of bauxite. Most of this ore has been used in the chemical industry because of its relatively high silica content, but recent metallurgical research indicates that it can be used as a source of metallic aluminum.

### ALABAMA

»»» The people of the state, as a whole, are cooperating with the OPA in the matter of food rationing, with very little complaining. However, there is a small percentage of them, more or less uninformed, who complain that the government is imposing on them and causing them unnecessary inconvenience. There are others who, for political reasons, complain that the administration is taking advantage of the situation and causing a lot of hardships on the common people.

»»» Despite all efforts for the promotion of safety in mining operations in the state, and the fact that the Department of Safety is constantly making an earnest effort to improve conditions, there was a serious explosion on May 11 in one of the larger mines of the state, which took the lives of 11 men and injured four others. The explosion seems to have been caused by a gas pocket being ignited by a spark.

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### VERMONT

»»» The Vermont Asbestos Mines Division of the Ruberoid Company, which is the largest producer of asbestos in the United States, continued to operate its open pit mine and well equipped mill near Eden, Lamoille County. Shingle stock and molded break-lining fiber are important products, but several shorter grades of asbestos are produced in large quantity.

### NEW YORK

»»» Headquarters of the anthracite industry are now centralized in New York City at 101 Park Avenue. Both the Anthracite Institute and Anthracite Industries, Inc., occupy new offices on the eighth floor of the building. Both organizations are supported by the majority of the anthracite producing companies of Eastern Pennsylvania, and have been located in New York City for some time, the former at 19 Rector Street, and the latter in the Chrysler Building. Frank W. Earnest, Jr., president of Anthracite Industries, Inc., was recently named executive director of the Institute, and will direct the affairs of both organizations. However, both groups will continue to operate independently in their separate fields, as in the past, it was announced.

### CONNECTICUT

»»» The Tollgate mica-feldspar deposit, three miles southeast of Middletown, Conn., has been mined intermittently for nearly a hundred years. Worked in its earlier days chiefly for feldspar, it has attracted interest recently as a possible source of sheet mica. The deposit is sheet of pegmatite intruded into schists and quartzites. The sheet trends nearly north-south and dips rather steeply to the west. A quarry about 300 ft. long, 40 to 100 ft. wide, and 20 to 35 ft. deep has been excavated in the deposit.

The Geological Survey reports that commercial muscovite (white mica) occurs principally in the central part of the quarry, where the pegmatite sheet is zoned. The mica is found chiefly in a layer 4 to 7 ft. thick immediately beneath the upper surface, or hanging wall, of the pegmatite, and a similar layer 4 to 5 ft. thick along the lower surface, or footwall. The mica forms books (crystals) 2 to 18 in. broad and  $\frac{1}{2}$  to 6 in. thick intergrown with quartz and feldspar. The books are most abundant in the hanging wall layer, and within this they are further concentrated into several pipelike bodies that plunge gently northwestward, following undulations or "rolls" of the hanging wall.

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## Central



## States

### ILLINOIS

»»» On May 3 the Goodman Manufacturing Company was awarded the Army-Navy "E" for outstanding production. Ceremonies of the occasion took place in the Tilden Technical High School, Chicago, with Colonel Carl A. Waldmann making the presentation. Addressing the 1,600 persons attending the ceremony, Colonel Waldmann said, "Although the majority of you are already familiar with the story of your company's part in the nation's war effort, let me briefly point out certain aspects of it which, from the standpoint of the United States Army have been especially noteworthy. First, you have undertaken the manufacture of several unfamiliar items of ordnance material, yet you have met or bettered delivery schedules. Second, your operations have been conducted with marked efficiency as evidenced by few rejections and reduced costs. On four important items, prices have been reduced 20 to 40 percent below original figures. Third, you have successfully overcome an acute labor shortage by working long hours, by an intensive training system and thorough tooling to an extreme degree. Fourth, when unable to obtain new machines, you converted obsolete machines and made other substitutions to overcome production difficulties."

The flag was presented to William E. Goodman, president of the com-

pany. Some of Mr. Goodman's comments on accepting the flag were, "Never in the past has such an outstanding act of recognition come to our company and it gives us a thrill, a sense of pride and of accomplishment in thus being recognized. Let me express appreciation to all the foremen and to all the shop production and engineering staff on whose shoulders has rested the deciding on how the work was to be done and the following of it through the shop. Men and women of our company, I congratulate you all on the success of this team work and the high honor that your efforts have brought to our company."

»»» Solid Fuels Administrator for War Harold L. Ickes announced on May 15 that steps have been taken to terminate Government control and operation of certain bituminous coal mines in the state of Illinois. The mines are those which have a contract with the International Union of Progressive Mine Workers of America. They produce in excess of 10,000,000 tons annually.

Legal instruments implementing the proposed termination of Government control have been sent to the operators. They provide for the release of the Government and its officials from all claims or liabilities which may arise out of Federal control. Upon the return of the completed agreements and their approval, the orders



Wm. E. Goodman receives congratulations from Col. Waldman and Lt. Com. Soderstrom

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Keep a Simplex Automatic Lowering Mine Jack on every coal cutter, loader, and locomotive—it pays. Time spent by miners looking for a jack cuts production. Shoving and tugging is time-wasting and hazardous.

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LEVER SCREW HYDRAULIC  
Jacks

®

## PARMANCO Horizontal Drills

PARMANCO Horizontal Drills are used exclusively in the Iron Range for horizontal drilling.

They are also used by a large percentage of the strip coal mines. The new PARMANCO Vertical Drill has revolutionized test drilling. Write us your drilling problems.



**PARIS MANUFACTURING CO.**  
PARIS, ILLINOIS

ending Government control will be issued.

The release is upon representation of both the miners and the operators that these mines are running under an existent contract voluntarily entered into between workers and owners, and further, that there will be no strike or danger of stoppage in the future. This was further implemented by a new "no-strike" pledge of the Progressive Mine Workers and a commitment not to engage in a proselytizing campaign as a result of the release from Federal custody. This permitted the Secretary of the Interior, under the executive order, to act to release the mines on the ground that he is only directed to operate mines in which there is a strike or danger of stoppage.

#### MISSOURI

»»» The American Zinc, Lead & Smelting Co. recently encountered a deposit of high grade lead on the McCallister property east of Aurora, Mo.

»»» One of the worst floods in the history of the Tri-state zinc field occurred on May 18. Production was curtailed sharply and some mines will require several weeks to be dewatered. Howard I. Young, director, WPB Minerals Bureau, visited the district immediately after the flood, and arrangements were made with the Eagle-Picher Mining & Smelting Company for the pumping of the flooded mines. To assure a minimum loss of time in bringing the mines back into production for the war program, RFC has agreed to pay for the necessary dewatering activities.

Those producers whose mines were flooded and who have positive premium price contracts with Metals Reserve will be given a consideration to their deficits for May and June. It is expected that operations in the district will approach normal early in June, as the general situation was not as serious as believed at first.

#### MINNESOTA

»»» The shaft sinking program of the Oliver Iron Mining Company at its Fraser Mine has reached the 450-ft. horizon. At this point water was encountered and sinking operations have been temporarily discontinued until a 1,000-ft. drainage crosscut is driven from the shaft to the Fraser open-pit. Upon completion of the drainage project, shaft sinking will continue to 600 ft.

»»» The iron ore schedule for 1943 has been revised downward by the War Production Board. Iron ore shipments for the current season has been set at 91,000,000 gross tons. The first estimate by WPB totaled 95,000,-

000 gross tons. Due to the late opening of the shipping season this action by WPB was not unexpected.

»»» Women on the Mesabi iron range are contributing their bit to help win the war. Recently the Oliver Iron Mining Company employed 24 women as analysts in the company's iron ore laboratory, at Hibbing, Minn. Preliminary training for this work was obtained at the Junior College at Hibbing and the Chisholm High School at Chisholm, Minn.

»»» A large stripping operation is under way at the Embarrass

Mine on the Mesabi range. Operators of this project recently purchased a new 5-cu. yd. electric P&H shovel which will soon be in operation.

#### MICHIGAN

»»» Officials of copper and iron mines in Michigan's upper peninsula undertook a 15-day salvage drive for surface scrap in May. John M. Bush of Cleveland-Cliffs Mining Company of Negaunee, Mich., directed the campaign. He is chairman in upper Michigan for WPB's industrial salvage campaign.

## GOOD SHOOTING-- Counts in Mining, Too

If you are not getting the best out of your Shooting — you're apt to be hit where it hurts — in less tonnage — in less safety — loss of good shot-placement — and in increased time and powder costs.

Mines using SEALTITE TAMPING BAGS have decreased tamping time — powder costs and increased tonnage by aiding their shot placement and powder-charge with proper tamping to bring-down more coal.

For "proof of the pudding" consult your local SEALTITE TAMPING BAG distributor or write us direct. We are prepared to serve more mines.

### SEALTITE TAMPING BAGS

**TAMPING BAG COMPANY**  
MT. VERNON, ILLINOIS

## Western



## States

### IDAHO

»»» Block leasing in mines throughout the United States is to be resumed for the benefit of the war effort, according to W. Earl Greenough, War Production Board western representative for lead and tin, with headquarters in Salt Lake. In a letter to Harry W. Marsh, secretary of the Idaho Mining Association, Mr. Greenough says the decision releasing the leasing tieup "is applicable nation-wide and industry-wide." It was pointed out that resumption of leasing operations would result in mining of substantial quantities of ores which could not be economically developed or mined under company operations, and would make available for production of war metals the services of many older miners not capable of prolonged routine work.

»»» The annual report of the Polaris Mining Company for the year 1942 shows net profits of \$38,693.24 after all deductions. The company paid one dividend of \$60,000 during 1942. Recent additions have been made to the Polaris milling plant whereby the company will be able to handle 300 tons a day from a tailings dump near the mill, which will produce lead and zinc values.

»»» Idaho prospectors and mine operators have developed at least six of the strategic and vital minerals to commercial importance since the United States entered the war, according to the annual report of Arthur Campbell, state mine inspector, who lists the new minerals as copper, tungsten, antimony, quicksilver, cadmium and vanadium, and mentions molybdenum and cobalt as possible new developments in the near future, if demand continues.

»»» At the annual meeting of the Hecla Mining Company held in Spokane, Wash., recently, the company declared a dividend of 25 cents a share, totaling \$250,000, bringing the dividends declared this year to \$500,000 and the total dividend record for the company to \$26,405,000.

L. E. Hanley, president and manager of the company, announced at the meeting that a vein of high-grade ore had been opened in the Polaris mine, in which Hecla owns the con-

trolling interest. He said the ore is about 10 in. wide and assays 74 percent lead and 145 oz. in silver.

President Hanley also advised the stockholders that the Hecla Company's new 1,000-ton capacity sink-and-float plant under construction at Osburn to treat 1,500,000 tons of zinc-lead tailings is about completed and will be ready for operation early in June. The sink-and-float plant will discard about 40 percent of the waste material, and the recovered mill feed will be treated at the Polaris and Hecla mills. The Hecla Company has also prepared the Silver Cable mine east of Mullan for production of zinc-lead ore which will be treated at the Hecla mill this season if manpower is available for the mining operation.

»»» The old Senator Stewart mine, adjoining the Bunker Hill property at Kellogg, has been sold to the Silver Bowl Mining Company, a local stock company organization. From 1912 to 1916 the Senator Stewart was operated by the late F. Aug. Heinze of Butte and during that time paid its stockholders \$3,000,000.

»»» The Crystal Lead property, owned by the Day interests, and located at the head of the west fork of Eagle Creek in the Murray District, is preparing to join the list of producing mines this summer. The U. S. Forest Service is now completing a seven-mile long road to the property, which has two lead-silver veins opened and ready for production.

»»» After a steady production record of 1,400 to 1,500 tons of ore per day for the past 55 years, the Bunker Hill & Sullivan M. & C. Company officially reports ore reserves blocked out and ready for mining at 2,839,620 tons, as compared to 2,730,398 tons at the close of 1941. In the 1942 report President Stanly A. Easton mentions it in a few words, saying: "An important find of new ore on No. 13 level was made in an area of the mine not heretofore prospected."

»»» Clayton Silver Mines Company, operating a new silver-lead-zinc property at Clayton, Idaho, in the Salmon River country, this month declared a dividend of 1½ cents a share and totaling \$45,000, payable June 21 to stock of record May 20. C. A. Fay, engineer and manager for the company, reports the development of a

new ore body of large tonnage possibilities on the 300-ft. level. Stoping operations are being carried on in this ore 10 ft. wide, averaging 5.8 percent lead and 7.7 oz. silver per ton. As the stope advances test holes are being drilled into the walls and results indicate the ore zone to be at least 26 ft. wide. Assays on the sludge range from 4.8 to 12 percent lead and from 10 to 16 oz. silver.

### MONTANA

»»» Montana held second place in silver output in the United States in 1942, producing 11,450,025 fine ounces of silver. However, the 1942 production was 936,000 less than 1941, a result chiefly due to the suspension of operations in May of nearly all of the zinc mines of the Anaconda Copper Mining Company at Butte. Mines in the Butte district produced about 8,100,000 ounces of silver in 1942, or about 79 per cent of the state's total, and earned from the Anaconda Copper Mining Company the title of the largest silver producer in the United States. Silver and concentrates from copper ore and zinc-lead ore accounted for about 56 and 20 per cent, respectively, of the state output in 1942.

### WASHINGTON

»»» In 1942 Washington produced 368,010 fine ounces of recoverable silver, a decrease of 34,020 ounces from 1941. The Holden property of the Howe Sound Co. in Chelan County, with a decreased production, remained the largest silver producer in the state (47 per cent of the state total). The Knob Hill Mines, Inc., second in production of silver in Washington in 1942, operated its Knob Hill and Mountain Lion groups in the Republic district, Ferry County, and produced about 39 per cent of the state silver. Other important silver producers in the state were the Aurum Mining Co. and the Eureka Mining & Milling Co., both in the Republic district, Ferry County.

### WYOMING

»»» Prospecting for minerals needed for war has brought forth another interesting sidelight in geological study comparable to the one in Idaho where diamond drilling in an antimony deposit resulted also in disclosing a hitherto unknown large quantity of tungsten. The name of Don E. White of the Geological Survey is recalled as the first engineer who found tungsten in the diamond drill cores in this particular prospecting program.

The Geological Survey recently released the interesting developments

which have occurred in studies of phosphate beds in Idaho and Western Wyoming undertaken since 1911. At that time data were being collected in preparation for the day when our eastern phosphate beds would be depleted and full knowledge of our western reserves would be suddenly demanded. Studies of the phosphate deposits were continued year after year as the part of the Survey's classification of public lands. Analyses were made by chemists of the Survey, the Department of Agriculture and others, including private companies. In 1925, a commercial mining company, aware by that time of the traces of vanadium in the phosphate rock, began a series of experiments in the endeavor to save the vanadium as a by-product in their phosphate mining. By 1941 they were able to develop methods by which this saving was accomplished, but they had no inkling that other obscure beds not far away contained a much higher percentage of the important metal needed in making steel alloys.

In 1937, W. W. Rubey, a Survey geologist, with many years of outstanding work, took over the phosphate studies. Like his predecessors, he was searching for phosphate fertilizer for peaceful farmers, but the trail led to a deposit that holds high promise of solving a difficult problem now in the Nation's war effort. From 1937 to 1940 Rubey collected many samples of the phosphoria formation and carefully plotted the location of each sample in the rock sequence. One day the chemist reported on his analysis of some of the rocks that are associated with the phosphate layers and it was found that some inconspicuous and unimportant dark shales and mudstones contained much more vanadium than did the phosphate rock itself.

In the winter of 1939 and 1940 the Geological search was shifted from fertilizer to vanadium. Continued careful sampling of the various beds and chemical analyses disclosed a high content of vanadium from one particular bed.

In the spring of 1942, Rubey again entered the field with the new data in hand to test the concept that had been slowly forming in his mind, namely, that a single obscure bed of workable thickness contained vanadium in commercial quantities and that the bed had wide extent. He established a field laboratory for rapid analyses on the ground. More trenches were dug and samples taken and further analyzed. The Bureau of Mines assigned engineers to the project. The bed proved to be vanadium bearing nearly everywhere and its position and strike was carefully plotted. When all of these facts were established and the mapping had been completed the data were turned over to the Bureau of

Mines, the War Production Board and the Metals Reserve Company. The project was reviewed by the War Production Board which certified it to the Metals Reserve Company and a development contract was written with the Homestake Mining Company and preparations are now under way for production.

## ARIZONA

»»» Increased service for testing the applicability of dry magnetic concentration to Arizona ores has been announced by the Arizona Bureau of Mines at the University of Arizona, coincident with the installation of a new magnetic concentrator adapted to strongly magnetic substances. A year ago the bureau installed the first of its magnetic concentrators adapted to weak magnetic ores. The bureau now is ready to handle tests on many more samples than in the past, it is said by Dr. T. G. Chapman, director.

»»» Scattered throughout Arizona, 15 field men of the U. S. Geological Survey are pushing a survey of all promising deposits of molybdenum, manganese, tungsten, lead, zinc, copper, beryllium, and asbestos. Their work involves the investigation of the geology and a complete report with maps on the deposits, to precede any exploration work of the U. S. Bureau of Mines, now making extensive examinations in the state.

»»» Exploration work in the Planet mine, near Bouse in Yuma county, once worked for its copper but now discovered to hold a substantial tonnage of high-grade iron ore, is announced by the U. S. Bureau of Mines, one of the seven projects now underway by the bureau. Growth of steel-producing industries on the west coast may bring about an early opening of the property, according to J. H. Hedges, director of the U. S. bureau's southwestern station in Arizona. An old railway roadbed to Bouse, spur of the mainline to Yuma, may be utilized for a new rail line or a truck roadbed to move the ore, it was said.

»»» Production is expected soon at the new Castle Dome open pit copper mine near Miami which has undergone more than a year of development work. More than 500 men are to be employed, it is said.

»»» An extensive program of diamond drilling and sampling has been announced in Coconino County on the Mardun lease by the Coronado Copper and Zinc Company. The tests will determine the feasibility of operations in a large low-grade ore body recently outlined on the Navajo Indian reservation. The Mardun lease, north of The Gap, lies 112 miles from Flagstaff, in northern Arizona.

»»» Arizona increased its production of copper during 1942 over the previous year by 64,183 short tons, according to the U. S. Bureau of

# MACWHYTE MINING ROPES



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- **Made by craftsmen with years of experience**

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Manufacturers of MACWHYTE PREformed and Internally Lubricated Wire Ropes... MONARCH WHYTE STRAND Wire Ropes... MACWHYTE Special Traction Elevator Cables... MACWHYTE Braided Wire Rope Slings... MACWHYTE Aircraft Cables and Tie-Rods.  
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Mines. The 1942 production was 390,500 short tons. Nine mines yielded 99 percent of the total recoverable output, the largest of these the New Cornelia mine at Ajo in southwestern Arizona. Six copper smelters operated during the year at Hayden, Clarkdale, Douglas, Superior, Miami, and Morenci. The total rated capacity of these works is 4,380,000 tons of charge per year.

## COLORADO

»»» The production of recoverable silver in Colorado was 3,073,140 fine ounces in 1942, a decrease of 4,228,557 ounces from 1941. Mineral County, second largest producer in Colorado in 1941, attained the lead position from Eagle County in 1942 by virtue of the further curtailing of production of copper-iron-silver-gold ore in favor of zinc-lead ore by the New Jersey Zinc Co. Empire Zinc Division from its Eagle mine at Gilman, Eagle County. Mineral County production of silver in 1942 was 823,726 fine ounces (27 per cent of the state total) while Eagle County 1942 silver production was 353,219 fine ounces, a 92 per cent decrease from 1941. Silver was produced from virtually every lode-mining county in Colorado. The counties producing over 100,000 fine ounces of silver were in order of output: Mineral, San Juan, Eagle, San Miguel, Pitkin, Lake, Clear Creek, Ouray, and Dolores.

## UTAH

»»» Pumping out of the Ontario unit of the Park Utah Consolidated Mines Company has virtually been completed and a new source of lead-zinc ore will soon be tapped, according to the annual report of the company, which has just been released. Unwatering of the Ontario was made possible by revised premiums on lead and zinc. In 1942 the Park Utah suffered from shortage of labor, low metal prices and higher labor costs, which caused a substantial reduction in output.

»»» Delay in obtaining materials has retarded completion of the new electric power plant of the Utah Copper Company at Bingham, Utah. The plant is not expected to be completed and in operation until October, according to company officials. At that time the company will begin generating its own power for the first time for consumption in the huge Bingham open-pit copper mine.

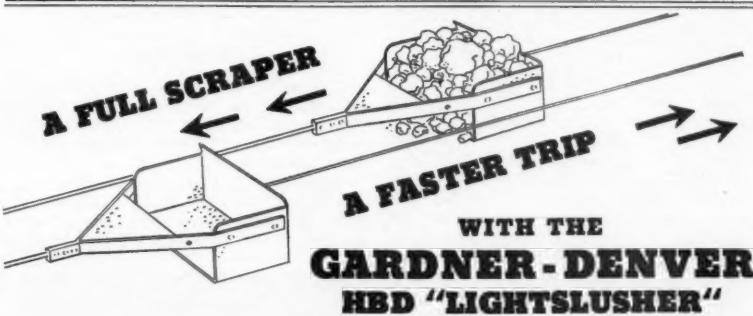
## ALASKA

»»» Near Orange Hill, in the upper Copper River region of interior Alaska, deposits containing recogniz-

able copper, molybdenum, gold, and silver mineralization have been examined by a geologist of the Geological Survey, as a part of the Survey's program of investigation of deposits of strategic minerals. A geologic sketch map of the area has been prepared, showing the mining claims of the Alaska Nubesna Corporation, the approximate topography and geology, and the area of most extensive mineralization in the intrusive rock. The locations of adits and diamond-drill holes are also shown. A limited number of photostat copies of the map will be available to those directly interested. Requests should be addressed

to the Director, Geological Survey, Washington, D. C.

»»» Silver is produced only as a by-product of gold mining in Alaska. The production of recoverable silver in 1942 was 145,656 fine ounces, a decrease of 24 per cent from 191,522 fine ounces in 1941. The Alaska Juneau Gold Mining Co., operating lode-mining properties at Juneau in Southeastern Alaska, produced about 40 per cent of the total silver output of the territory. The remaining 60 per cent was recovered chiefly as a byproduct of gold placer operations.



Gardner-Denver HBD "Lightslusher," showing cable guide rollers.

### OTHER GARDNER-DENVER AIR HOISTS



Gardner-Denver Model HK—a powerful single-drum hoist weighing 440 lbs.—capable of handling a 2000 lb. vertical lift, 130 ft. per minute at 80 lb. air pressure.

Gardner-Denver Model HKD—an outstanding double-drum scraper hoist, larger than the HBD, and powered by a larger five-cylinder air motor. Dragging operations fully controlled by motor throttle alone.



Light and compact, the Model HB develops a 1250 lb. rope pull at 62 ft. per min. and 80 lb. air pressure.

Gardner-Denver Model HK—a powerful single-drum hoist weighing 440 lbs.—capable of handling a 2000 lb. vertical lift, 130 ft. per minute at 80 lb. air pressure.

This compact, lightweight Gardner-Denver HBD Double-Drum Slushing Hoist provides powerful rope pull at low speeds for a fully loaded scraper—develops high speed in either direction for a quick load and a fast return. It's powered by the famous Gardner-Denver five-cylinder radial air motor that provides high torque at all speeds.

Other advantages of the Gardner-Denver Model HBD "Lightslusher" include:

**COMPACTNESS**—for narrow stope or drifts—weighs 270 lbs.

**FREE WHEELING CLUTCH**—"Offset Roller Clutch" makes possible complete and simple control through air throttle alone.

**SEALED CONSTRUCTION**—all working parts run in oil—sealed against water or abrasive sludge.

**BIG CAPACITY**—normally used with 22-inch or 24-inch scraper, although it has superior torque and speed to handle large scrapers where working conditions permit.

**UNIVERSAL MOUNTING**—for bolting to timbers or for clamping on a drill column.

**LITTLE FRICTION LOSSES—LESS WEAR**—since ball-bearings are used throughout the air-motor, gear train, drive shaft, and guide rollers.

**NO WASTED AIR**—the motor does not idle between trips—air is consumed only when work is being done.

For a bulletin describing the many types and sizes of Gardner-Denver single-drum and double-drum air hoists, write Gardner-Denver Company, Quincy, Illinois

# GARDNER-DENVER

Since 1859



# Manufacturers' Forum

## New Products for Coal Dusting

The Johnson-March Corporation, New York, N. Y., the originators and manufacturers of film-forming chemicals used in the coal mines, coal trades, construction and other fields announces two additions to its line for rendering coal permanently dust free. These two additions are Coaladd A—for use on the extremely porous mid-western coals and Coaladd DCW—for use on extremely wet coal or coal coming from certain washeries and on coal destined for cold climates such as the upper Great Lakes regions. These two grades function in much the same way as the standard Coaladd. They form a plastic insoluble film over the surface of the coal pieces. It is a film that transfers its dust-killing effectiveness to other pieces so that when breakage takes place during handling, the new surfaces are contacted and given a protective coating.

Coaladd A forms a highly viscous liquid. It is said to have special covering powers to "bridge" the pores of the mid-western coals which have been heretofore difficult to treat. The special chemicals used in Coaladd A do not corrode metals or attack rubber belting. This non-corrosive effect makes the liquid a desirable treatment for coal intended for domestic and industrial stoker use, as it is said to be clean, odorless and has no occupational hazards.

Coaladd DCW is a specially compounded granule with special film-forming and non-freezing characteristics. It is applied dry—as received. Extremely wet coal would tend to drain off and dilute liquid types of dust treating compounds; likewise with so much moisture, there might be a tendency to freeze. But this product is said to counteract these tendencies. It uses the water already on the coal, therefore the total moisture is reduced, not increased by treatment. Coal add DCW due to its peculiar composition "sticks" while the excess water drains away.

## "Use the Air You Need But Don't Waste It"

This is the theme of a new series of industrial posters sponsored by Ingersoll-Rand Company, manufacturers of air compressors and compressed-air-operated tools. The purpose of the series is to wage war on leaky hose couplings, valves, and other pipe fittings—and, by so doing, to help speed production and avoid wasted power.

Done in two colors, the posters make generous use of splash illustrations. Text, printed in large, bold-face letters, is held to a minimum; the messages can be absorbed in a few seconds. In several of the posters, both the "right" way and the "wrong" way

are graphically illustrated. It is believed that the series has definite educational value, and that it constitutes an effective campaign against the waste of power.

At the present time, five posters of the series are available, with others in preparation. The desired number of copies may be obtained by writing to any office of Ingersoll-Rand Company, or to the head office at 11 Broadway.

## Cleaning Goggles

The new M.S.A. Goggle Cleaning Station, announced by Mine Safety Appliances Company, encourages workers to wear their goggles and to keep them clean.

Designed for convenient wall mounting throughout the plant the unit consists of a compact case equipped with Fogpruf—an efficient lens cleaning



and anti-fogging agent—and Optical Wiping Tissues.

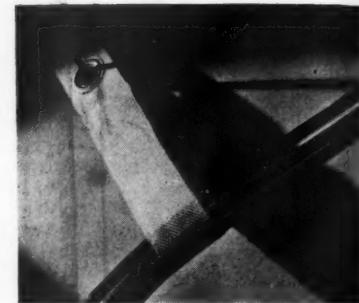
Operation is simple. A tap on the inverted vial sprays Fogpruf on the goggle or spectacle lens. Cleaning tissues are pulled from the opening in the top of the station, and may be discarded in a receptacle in the lower part of the case. The front panel of the station slides up, making easily accessible a compartment for an additional supply of tissue and Fogpruf.

## Glass Fiber Cable Hanger

For use in mines and on construction projects a durable, glass-fiber cable hanger has been developed by Westinghouse Electric and Manufacturing Company. Production delays caused by damaged cable are prevented when cables are held up off the floor or ground.

This glass fiber cable strap is said to be impervious to moisture and will not rot, stretch or shrink. This hanger is capable of supporting approximately 200 lb. The glass fibers are

protected and the insulation value increased by a heat-resisting varnish treatment.



The standard size hanger is 14 in. long by 1 1/2 in. wide. The 1/2-in. metal grommet in each end permits nailing to wooden pillars. Straps are used to support cable as shown, or can be wrapped around cable to prevent slippage.

## Air Cooled Electrode Holder

An air cooled electrode holder for use on heavy metallic arc welding jobs around mines is announced by Jackson Products, Detroit, Mich. Where rods as heavy as 1/2 inch are used, the intense heat frequently causes discomfort to the welder, thus reducing his efficiency. This insulated heavy duty holder is cooled by air at from three to four pounds pressure, traveling the entire length of the lower tong. It is introduced by connecting the air inlet tube to the plant air line.

The holder is made of special high conductivity copper alloy, with deep-slotted jaws that grip rod tightly and hold it at correct angle. A dependable solder cable connection is provided.

## Removing Insulating Varnish

A stripping medium, designated as Sterling S-159 Stripper, which is said to provide fast and easy removal of insulating varnish from portions of the electrical equipment where varnish is not desired, has been developed by the Sterling Varnish Company, 220 Ohio River Boulevard, Haysville, Pa.

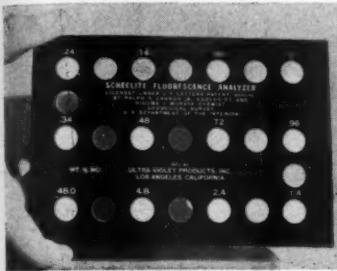
It eliminates the tedious and harmful scraping methods heretofore employed in removing varnish which may have splashed or drained on parts of the apparatus which should be varnish-free.

The medium is a blue viscous liquid which is brushed on machined surfaces or other metal parts prior to the actual application of the varnish to the piece as a whole. S-159 dries in two or three minutes after which the varnish is applied in the usual manner; dipping, spraying or brushing; dried at normal or elevated temperatures.

## Fluorescence Analyzer

Availability of the new government-approved scheelite fluorescence analyzer card—a revolutionary aid to tungsten operators—is announced by Ultra-Violet Products, Inc., 5205 Santa Monica Boulevard, Los Angeles, Calif., licensed by the U. S. Department of Interior to produce and distribute them.

The card is designed for use in conjunction with ultra-violet "black light"



mining lamps such as the Mineralight models manufactured by the company. Developed by R. S. Cannon, Jr., and K. J. Murata of the Geological Survey, the card makes possible instant comparison of ore samples with standard type scheelite examples to determine percentage of molybdenum content.

Measuring 4 in. by 6 in. the card carries 12 fluorescent checking examples, each  $\frac{1}{8}$  in. in diameter illustrating 12 molybdenum content gradations from 0 per cent to 48 per cent. Adjacent to each is a hole so that a sample of the ore to be tested may be placed beside the test example and examined under ultra-violet light to determine the value.

## Synthetic Elastic for Tank Linings

A method of bonding solid sheets of Koroseal directly to the welded steel, wood, or concrete of tanks, and thus extending the application of tank linings into fields which rubber cannot handle because of physical limitations is announced by the B. F. Goodrich Company. Koroseal is the plasticized polyvinyl chloride developed in its laboratories and used in many places where its qualities are superior to those of rubber. It is a synthetic elastic material with many rubber-like properties.

Principal advantage of this product in tank lining is said to be its remarkable corrosion resistance because of the inertness of its compounds to strong corrosives.

The company points out that the material has certain limitations both in temperature ranges and effects of various chemicals on it, and that it is essential that company engineers be furnished complete service details before the material can be recommended.

The new linings, made in sheets, are three times thicker than an earlier type, which employed fabric backing. This increase in thickness makes them withstand physical damage much better.

Advantages of the lining are cited by the manufacturer as follows: It can be applied in thicknesses up to and including  $\frac{3}{32}$  inches. It is not subject to physical damage and pin hole leaks suffered by many corrosion resistant paints. It will not, however, withstand physical abuse and metallic gouging. In such service an oversheathing of acid resistant brick is recommended. It is more resistant to abrasion than corrosion-resistant paint films. It is readily repaired if damaged. It has high electrical resistivity and prevents current losses in electrolytic action. It can be easily tested for leaks with an electric tester. It is highly resistant to oxidation, water, sunlight, and gas diffusion.

## New Air-Operated Controller

A new air-operated automatic control instrument, known as Convertible Free-Vane Controller, has just been announced by the Bristol Company, Waterbury, Conn. The new instrument is made for automatically controlling temperature (up to 3,600 deg. F.) flow, liquid level, pressure, draft humidity, pH value, and time program.

The controller operates on the same basic free-vane principle as that used in previous models offered by the company. In the convertible-type controller a number of design refinements have been incorporated, which simplify the instrument and make it more convenient to service. The new instrument is also designed so that the user can convert from one type of control system to another.

The air-operated controller is offered in the following types: Monoset (on and off), Ampliset (throttling), Preset, Reset, and Magniset.

## The Shiftograph

The Shiftograph is an instrument designed by the George S. May Company, 2600 North Shore Ave., Chicago, Ill., for use as a perpetual work shift schedule. By simply turning a dial, the user can tell at a glance what shifts certain crews will work, the days they work, and their days off. This instrument provides for several different plans of rotation wherein all employees are treated alike, for they share equally in desirable and undesirable work shifts.



## New Eye Protection for Welders

Development of a new eye-protecting glass—Didymium-Noviweld—which permits eyes of gas welders to pierce blinding glare and see welding operations from beginning to end, thereby increasing production of welded war equipment, is announced by the American Optical Company, Southbridge, Mass.

Lenses made of the new glass possess all the ray-absorptive properties of the manufacturers' Noviweld



glass, plus the special characteristics of Didymium, a combination of elements with high absorption in that particular portion of the visible spectrum where "flux-flare" normally obstructs clear vision.

In all types of flame-welding, the new Didymium-Noviweld safety goggles cut down the high intensity sodium rays of the fluxes. Flame workers can thus look right through the yellowish cloud of "flux-flare," see the rod and the molten area more clearly, and thereby step up their efficiency in every phase of the welding operation, particularly the flame welding of aluminum and steel. The lenses also are said to protect eyes by absorbing the harsh, tiring invisible ultra-violet and infra-red rays generated during welding.

## McNally Pittsburg Obtains Brazilian Contract

The McNally Pittsburg Mfg. Corp., with principal office and works at Pittsburg, Kans., announces completion of a contract with Companhia Siderurgica Nacional, State of Santa Catarina, Brazil, S. A., for a tipple and cleaning plant to process coal from the three mining districts of Lauro Muller, Urussanga and Crescimento. The plant will have a capacity of 500 TPH (short tons) with entire tonnage reduced to  $1\frac{1}{2}$  in. x 0 in. before processing and this tonnage then cleaned in McNally-Norton Automatic Washers and McNally-Rheo Launders. The 5/16 in. x 0 in. metallurgical coal will be dehydrated in McNally-Carpenter Centrifugal Dryers. In addition to the metallurgical coal the plant will produce  $1\frac{1}{2}$  in. x 5/16 in. or  $1\frac{1}{2}$  in. x 0 in. steam coal and power plant coal. The plant will be completed sometime this year.

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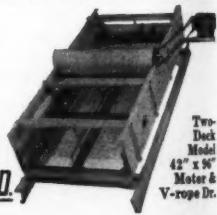
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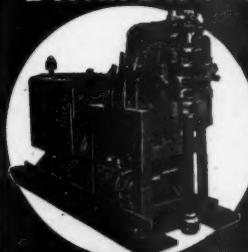
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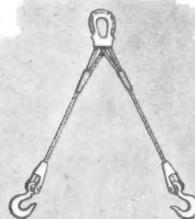
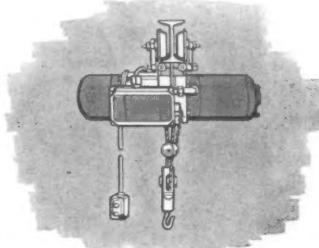
HUNTINGTON, W. VA.

# Salient

## POINTS IN CMP Re: Buying Wire Rope

### WHEN BUYING WIRE ROPE FOR INCLUSION IN A PRODUCT YOU ARE MAKING,

**REMEMBER:** Wire rope is a Controlled Material • Your orders should bear the abbreviated allotment numbers—such as: W-8-20 • Preference ratings on orders bearing allotment numbers are valueless. Wire rope producers are required to fill authorized controlled materials orders without regard to preference ratings • The allotment number on a wire rope order must show the actual month of delivery and *not* the quarter in which delivery is required.

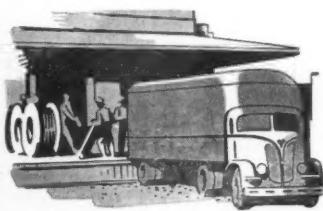
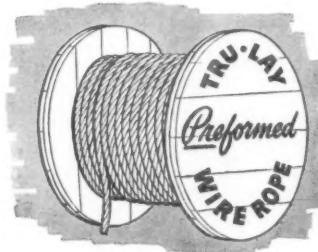


### WHEN BUYING WIRE ROPE ASSEMBLIES,

**REMEMBER:** Assemblies consisting of wire rope and fittings are Class B if they are air-borne, but Class A if they are not • If Class A, you must furnish us with an allotment of the steel required for the wire rope, and for the fittings if they are also class A • If Class B, you must not furnish an allotment of steel for either the fittings or the rope • In either case, your orders must bear allotment numbers or they cannot be considered delivery orders for products containing controlled material.

### WHEN BUYING WIRE ROPE FOR MAINTENANCE, REPAIRS, OR OPERATING SUPPLIES,

**REMEMBER:** Subject to the limitations imposed upon you by any "P" order under which you may be required to operate, and provided you produce a product or are engaged in any business in Schedules I or II of CMP Reg. 5, the symbol MRO on a wire rope order, followed by any appropriate certification, makes your order an authorized controlled material order, and • A preference rating is not required, because wire rope is a controlled material • Just be sure to observe the quantity restrictions stated in Par. (f), CMP Reg. 5.



### WHEN BUYING WIRE ROPE IN SMALL QUANTITIES FROM WAREHOUSES,

**REMEMBER:** You don't need an allotment number or a preference rating for wire rope if • 1—You order in amounts of \$10 or less, • or 2—If you don't buy more than 4,000 pounds per calendar quarter, or • 3—If you are authorized to buy it under Food Production Order 3 • Just be certain that you don't exceed the inventory limitations stated in CMP Reg. 2 • Certify your orders as stated in CMP Reg. 4.

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(May 20, 1943)



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